November 21, 2000

Mr. John J. O'Grady
Remedial Project Manager
Superfund division
USEPA Region V
77 West Jackson Blvd. [SR-6J]
Chicago, IL 60604-3590

by FedEx

Re: Fansteel Inc – North Chicago – Administrative Order,
Docket No. V-W-00-6-413
Designation of Contractors and Project Manager

Dear Mr. O'Grady:

In accordance with paragraph V.2 of the subject Administrative Order, please consider this letter as our notification on the contractor and potential subcontractors designated to implement the Engineering Evaluation/Cost Analysis ("EE/CA"). Carlson Environmental Inc. (CEI) is our designated contractor for this work. An updated Qualification Statement prepared by CEI is enclosed for your review.

Subcontractors that may also be retained to perform work under this Order include Great Lakes Analytical (laboratory services), Enviro-Dynamics, LLC (drilling services), Mid-America Drilling Inc. (drilling services), and Roy F. Weston (consulting services on risk assessments). Written qualifications for these subcontractors are also enclosed for your review (except for Great Lakes Analytical whose qualifications are described in their Quality Assurance Program Manual which has already been provided to you).

Finally, I will serve as the designated Project Coordinator responsible for administration of the actions required by the Order. Please find attached my Qualification Statement for your review and please note that I am located on-site in North Chicago. Please contact me if you have any questions or if you would like to discus this further.

Sincerely,

E. Jonathan Jackson

Enclosures

cc: Thomas Krueger (Assistant Regional Counsel, USEPA Region V,
77 West Jackson Boulevard, C-14J, Chicago, IL, 60604-3590)
Michael Mocniak (Fansteel)
Mark Steger (McBride Baker & Coles)
Margaret Karolyi (Carlson Environmental Inc)

QUALIFICATION STATEMENT
PROJECT COORDINATOR
FANSTEEL, INC. – NORTH CHICAGO – EE/CA

PROJECT COORDINATOR

Name:	E. Jonathan Jackson
Title:	Environmental & Safety Compliance Director
Address:	Fansteel Inc., Number One Tantalum Place, North Chicago, IL 60064
Telephone:	847/689-4900 ext. 556

EDUCATION

M.S., Soil Science, 1987, University of Wisconsin-Madison

B.S., Molecular Biology, 1981, University of Wisconsin-Madison

PROFESSIONAL EXPERIENCE

Fansteel Inc., Environmental & Safety Compliance Director
1997-Present, Industrial Sector, Environmental and Safety Program Management

Brown & Root Environmental (also known as Halliburton NUS), Environmental Scientist
1991-1997, Consulting Sector, Environmental Regulatory Compliance, Restoration, Soils and Risk Assessments

Wisconsin Power and Light Company, Environmental Scientist
1988-1991, Industrial Sector, Environmental Program Management, Regulatory Compliance and Restoration

Wisconsin Department of Natural Resources -Public Water Supply, Environmental Specialist
1987-1988, Regulatory Agency, Environmental Regulatory Compliance

University of Wisconsin-Madison, Soil Science Department
1981-1987, Natural Resources, Environmental Sampling and Analysis

Colorado State University, Natural Resources Ecology Laboratory
1983, Natural Resources, Environmental Sampling and Analysis

CERTIFICATIONS/ASSOCIATIONS

Certified Hazardous Materials Manager (CHMM). Institute of Hazardous Materials Management, Certification No. 1806, First Year Registered: 1989

Certified Environmental Auditor. Registration Accreditation Board, Certification No. E052444, Certified May 2000

PUBLICATIONS

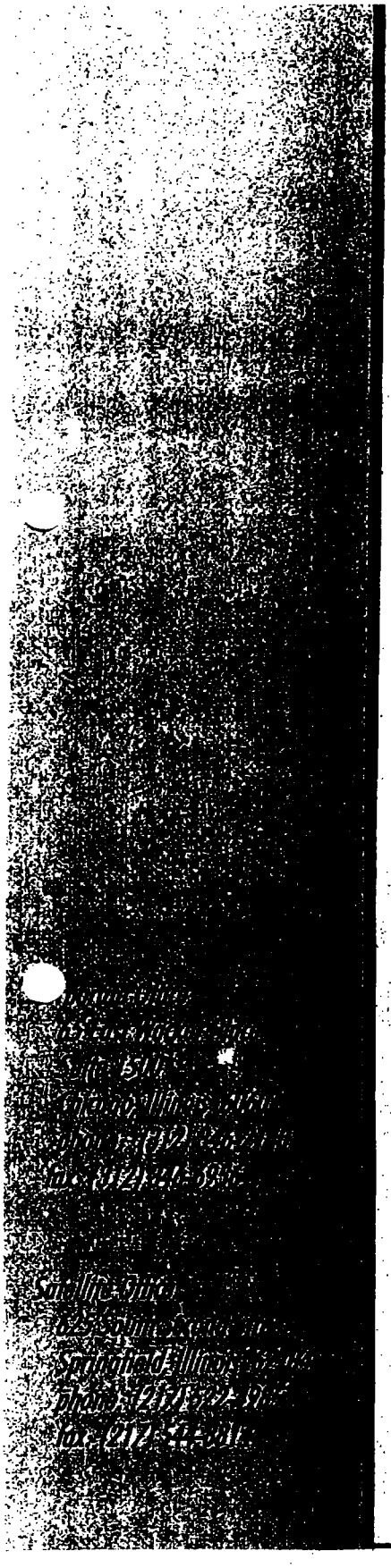
"Proposed PCB Disposal Amendments: Potential for Accelerating Cleanup and D&D Issues (co-author)," Proceedings of the Environmental Restoration '95 Conference, Department of Energy, Denver, Colorado.

"Case Study of a New Field Screening Tool for Delineating Soil PCB Contamination (co-author)," Proceedings of the 1991 PCB Seminar, Electric Power Research Institute (EPRI), Palo Alto, California.

"Environmental Considerations for the Divestiture of Electrical Substations (co-author)," Proceedings of the1989 PCB Seminar, EPRI, Palo Alto, California.

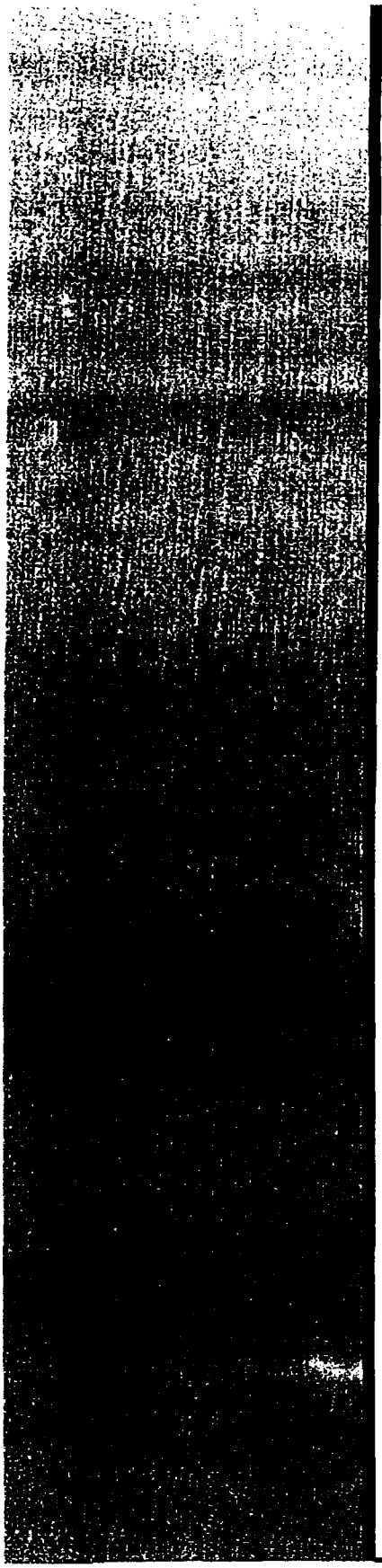
"Evaluation of an Ion Exchange Resin Method to Estimate Nitrate Leaching Losses in Sandy Soils," Thesis for Master of Science (Soil Science), University of Wisconsin - Madison, 1987.

CARLSON ENVIRONMENTAL, INC.



Services & Experience

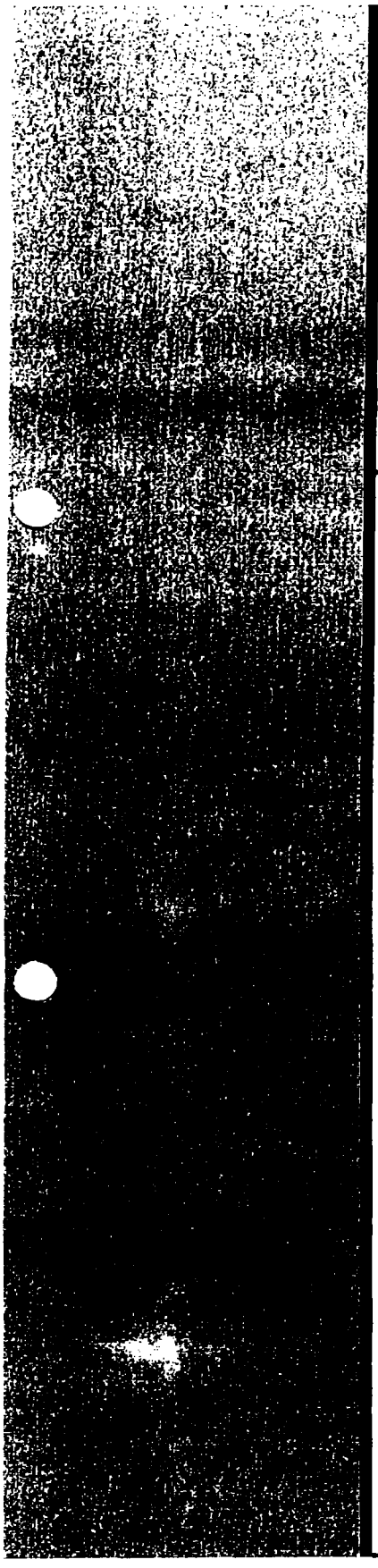
CARLSON ENVIRONMENTAL, INC.



CARLSON ENVIRONMENTAL, INC.

Section 1

Corporate Overview

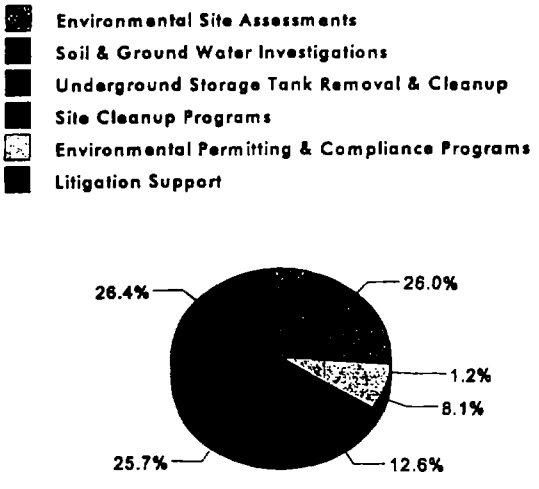


CARLSON ENVIRONMENTAL, INC.

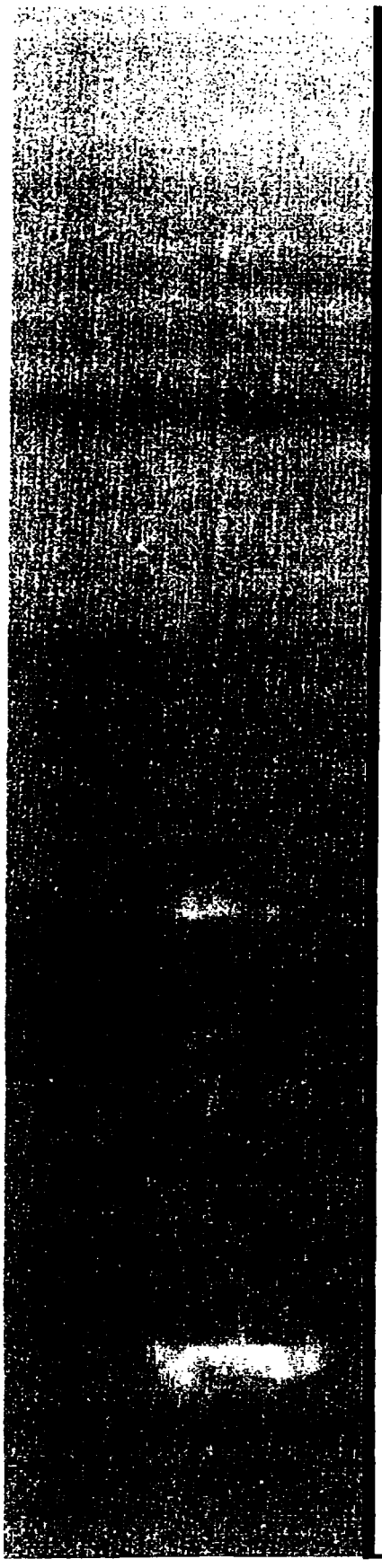
company background

Carlson Environmental, Inc. (CEI) was founded in 1988 by Dr. Richard J. Carlson, who had previously served as Director of the Illinois Environmental Protection Agency from 1981 through 1988. Dr. Carlson continues to oversee all aspects of the firm's engineering and consulting practice. CEI has evolved into a full service engineering and consulting firm. CEI maintains its principal office on the northeastern edge of Chicago's Loop, and a satellite office near the State Capitol Building in Springfield, Illinois.

BREAKDOWN OF SERVICES



CEI offers a broad range of consulting and engineering services designed to assist clients in managing environmental liability.



CARLSON ENVIRONMENTAL, INC.

integrated services

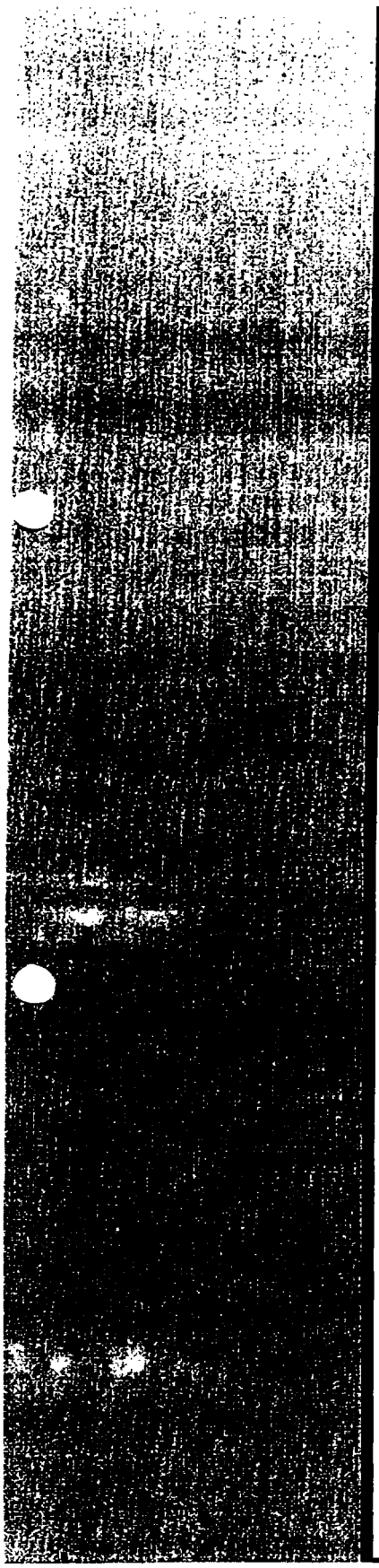
CEI's ability to integrate our services allows us to address virtually any environmental problem facing a client. From simple site assessments to complex soil and ground water remediation systems, CEI provides total project management/"one stop shopping" for all projects in each of our service areas.

client partnerships

Long term client relationships form the foundation of CEI's corporate philosophy. CEI believes in building true partnerships with clients in order to more effectively manage the environmental challenges facing companies today. With a specialized knowledge of the environmental and regulatory community, CEI works to create and implement economical solutions that bring our clients a step closer to achieving their business goals.

regulatory relationships

The ability to work effectively with state and Federal regulatory agencies is crucial to the development of successful compliance programs. CEI's experience with the related bureaucracies and their rules and regulations is extensive and well-rounded. CEI acts as a liaison between clients and the pertinent agencies, allowing us to tailor solutions that are advantageous to all parties.



benefits to clients

CEI offers clients a full array of services, from management consulting to engineering design and construction management. Our staff is large enough to provide depth of experience and expertise; yet, small enough to ensure that clients receive the full attention of the firm's principals and staff. Since its founding in 1988, there has been very little turnover in CEI's technical staff. Through CEI's combination of compact size, staff stability and varied project experience, our consulting services have come to be characterized by: responsiveness, attention to client goals, and successful problem solving.

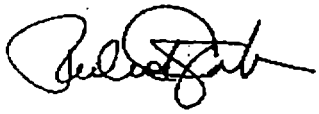
"As a firm that has succeeded because of long term client relationships and referral business, we believe in, and are committed to four basic tenets of client service. We at CEI:

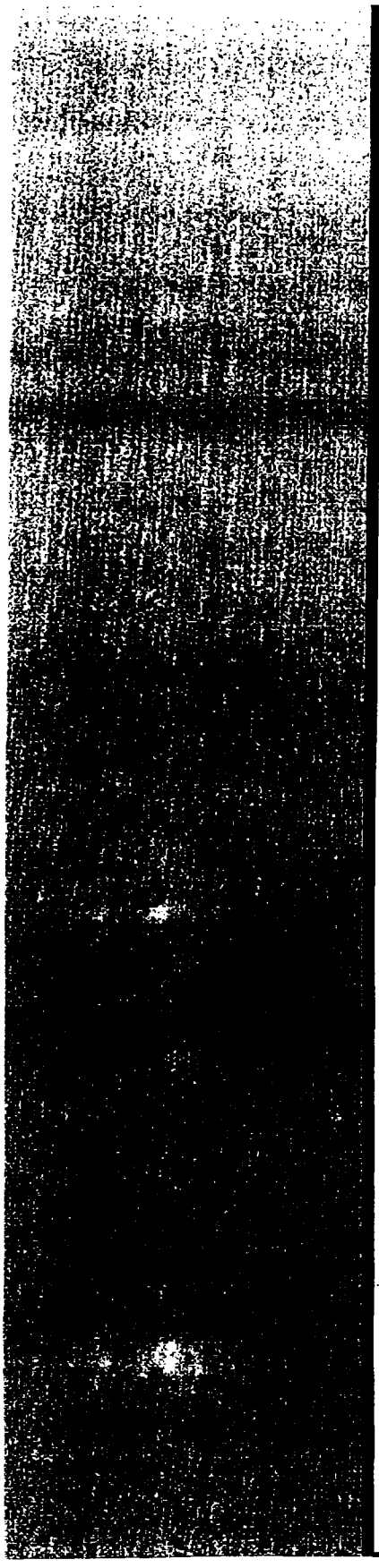
Show up on time;

Follow through on our promises ;

Finish what we start;

Say please and thank you."





CARLSON ENVIRONMENTAL, INC.

about our founder...

Dr. Richard J. Carlson, President and Founder of CEI, oversees all aspects of the firm's engineering and consulting practice. With over twenty years of executive experience in government and the consulting industry, Dr. Carlson has developed a unique ability to create cost effective solutions to the problems of corporate environmental compliance.

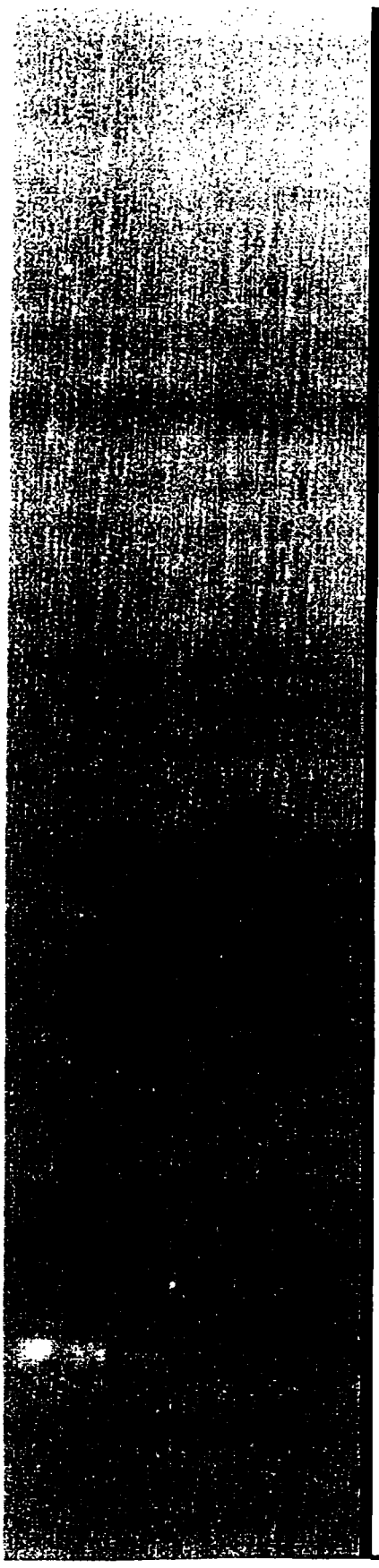
Prior to founding CEI, Dr. Carlson served as the Director of the Illinois Environmental Protection Agency from 1981 to 1988. As the State's top environmental regulator, Dr. Carlson guided the IEPA through the development of the Illinois Superfund program, passage of the Illinois Ground Water Protection and Solid Waste Management Acts, and the implementation of the Resource Conservation and Recovery Act.

Through participation in the National Governor's Association and various committees of the United States Environmental Protection Agency (USEPA), Dr. Carlson has developed a broad knowledge of regulatory agency activities throughout the country. Prior to his position as IEPA Director, Dr. Carlson served as Special Assistant to Governor James R. Thompson for Environmental and Natural Resources.

CARLSON ENVIRONMENTAL, INC.

Environmental Assessments

Section 2



CARLSON ENVIRONMENTAL, INC.

environmental assessments

Parties involved in real estate transactions and business mergers or acquisitions should carefully evaluate property and facility conditions to determine if the property has been *contaminated with hazardous substances and may require* cleanup under Federal or State law. If environmental problems *do* exist, the cleanup cost could equal or exceed the value of the property. For real estate loans, lending institutions now typically require environmental assessments *for commercial and industrial properties prior to financing* in order to identify environmental liabilities that might affect the value of the collateral.

- CEI conducts Phase I site assessments to determine if past or present activities may have resulted in soil or ground water contamination, or if other environmental issues exist at the site such as asbestos or wetlands.

- CEI also conducts Phase II field testing, such as soil sampling and ground water monitoring, to determine the nature and extent of contamination and to estimate cleanup costs.

- If site remediation is required, CEI will design and implement cleanup programs.

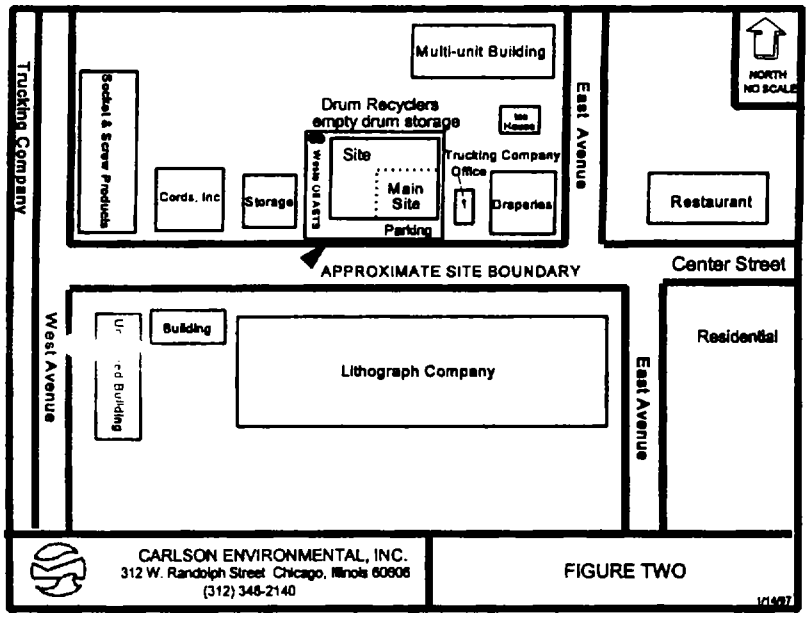
Conversion of a Manufacturing Facility to Residential Use

Chicago, Illinois
March 1995 to Present

On behalf of the developer, CEI conducted a Phase I Environmental Assessment for a site consisting of eleven buildings, two courtyards and two parking lots situated on 35 acres of land on Chicago's north side. The site had been the location of an electrical component manufacturing operation for over 60 years. In addition to the Phase I Environmental Assessment, CEI also worked on the terms of the purchase contract; provided oversight of investigation and remediation work conducted by the seller; and assisted in obtaining a Property Transfer Liability Insurance Policy to address environmental issues discovered during the development of the site. CEI will design and manage various cleanup activities agreed to be undertaken by the developer during the conversion of the site for residential use.

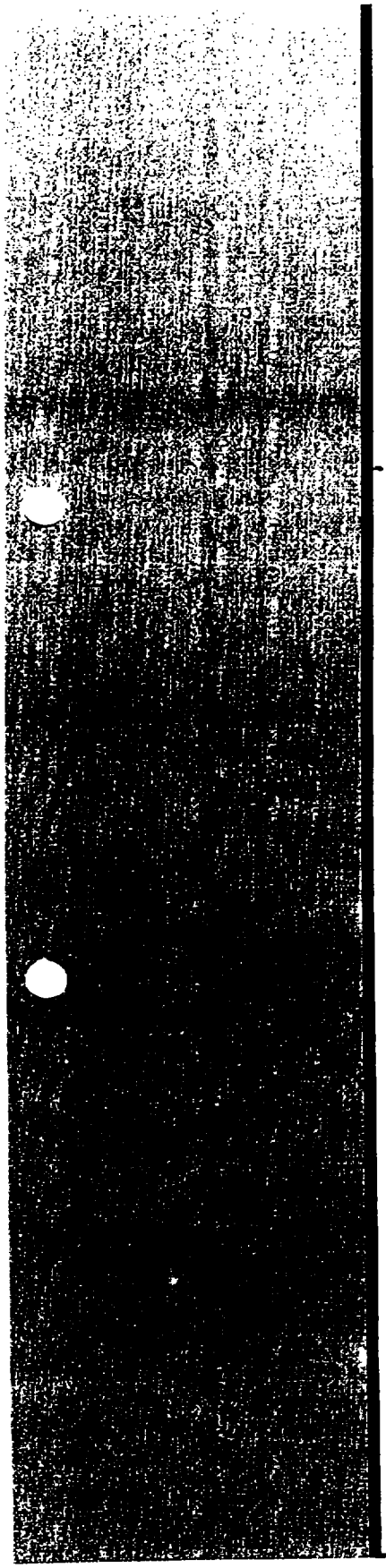
Multi-Site Assessment

As part of the due diligence required prior to forming one of the nation's largest real estate investment trusts, CEI performed Phase I Environmental Assessments on 32 industrial properties in the Chicago metropolitan area and Northern Indiana. CEI worked closely with the client and their attorneys to ensure that the environmental condition of each property was accurately represented to prospective shareholders.



Multiple Site Assessments, Chicago and Northern Indiana

Since that time, CEI has conducted over 50 Phase I/Phase II site investigations for properties as they are added to the Client's portfolio.



CARLSON ENVIRONMENTAL, INC.

Representative Clients

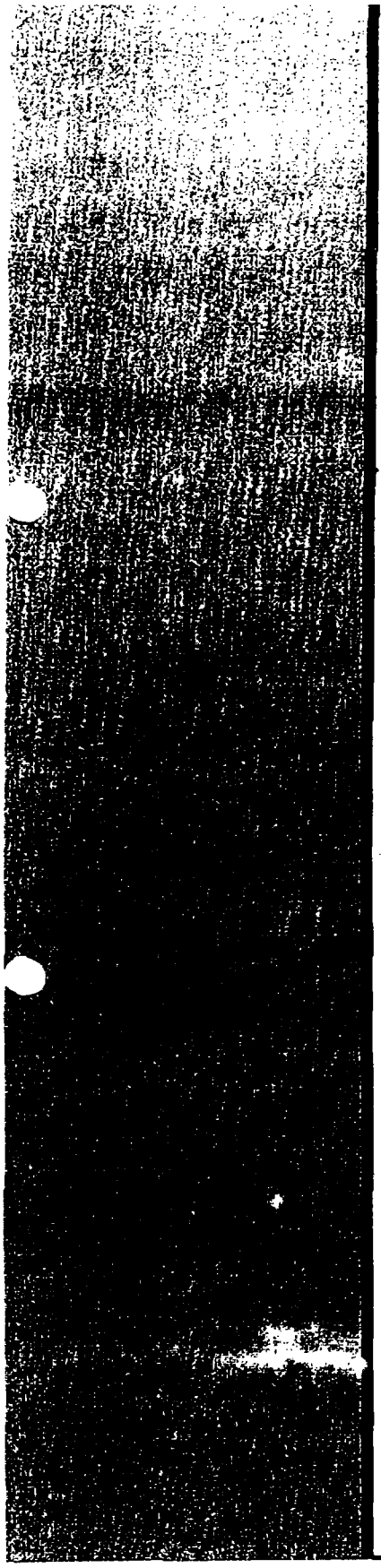
Environmental Assessments

Bank One
Bank of America/Nations Bank
CB Commercial
CenterPoint Properties Trust
Chicago Academy of Sciences
Citibank
Cole Taylor Bank
Colliers, Bennett & Kahnweiler, Inc.
Comerica Bank
Fidelity Mutual Life Insurance Co.
First Midwest Bank, N.A.
First National Bank of Illinois
The Foster Bank
General Motors Acceptance Corp.
Harris Trust & Savings Bank
Illinois Housing Development Authority
Korea First Bank
LaSalle Bank, N.A.
Marquette National Bank
Morgan Realty Partners
Old Kent Bank
Paine/Wetzel Associates, Inc.
The Prime Group
Pullman Bank & Trust Company
The RREEF Funds
Rubloff Development Group, Inc.
TCF Bank
Union National Bank of Elgin
Walsh Higgins & Co.

CARLSON ENVIRONMENTAL, INC.

Section 3

Soil and Ground Water Investigations



CARLSON ENVIRONMENTAL, INC.

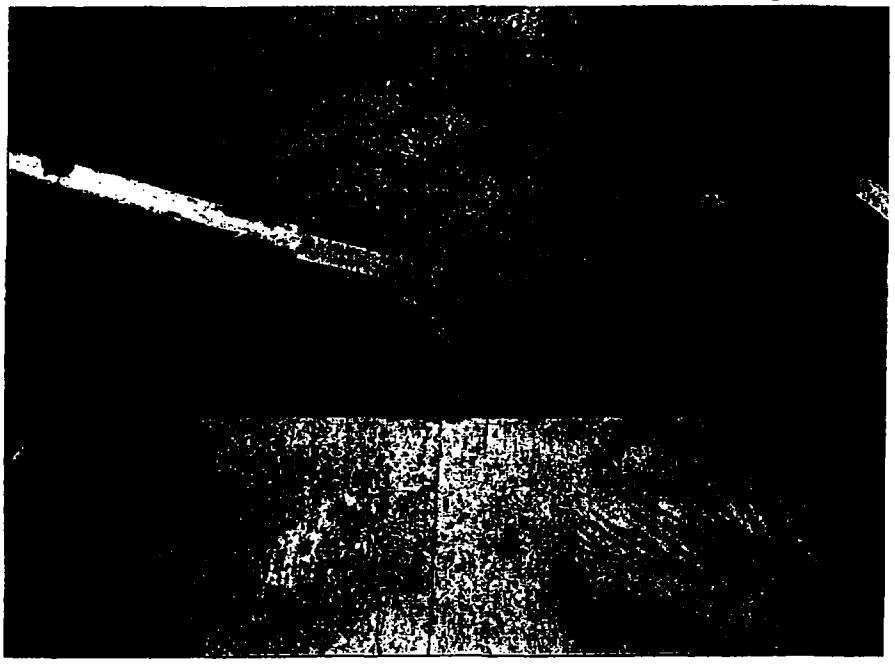
soil and ground water investigations

Chemical releases from past and current facility operations can have significant impacts on soils and ground water systems. The migration of these impacts requires knowledge of applicable regulations as well as the practical "know how" to define the extent of contamination and to design cost effective cleanup remedies. CEI conducts soil and sediment sampling; implements ground water monitoring programs; designs and constructs remediation systems; and provides comprehensive project management services.

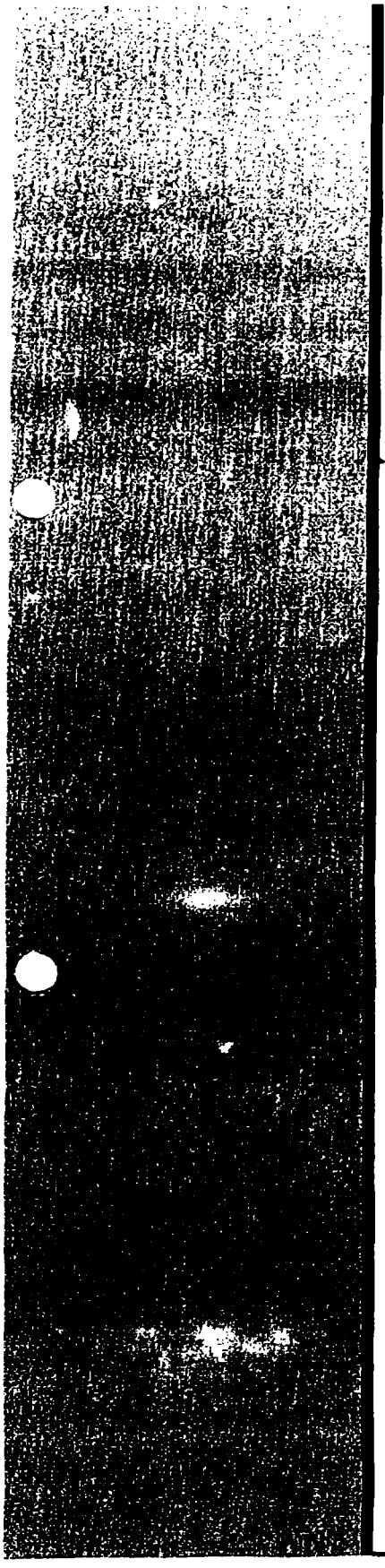
Sediment Sampling for a Dredging Program

Since 1988, CEI has provided technical support for an ongoing program of dredging in Lake Calumet. This has included periodic sampling of the lake bed to support a State water quality certification under the Army Corps of Engineers permitting program. The sampling program typically includes sampling of the sediment layer and the underlying clay matrix and analyses for chemical and geotechnical parameters.

Lake Calumet - Chicago, Illinois

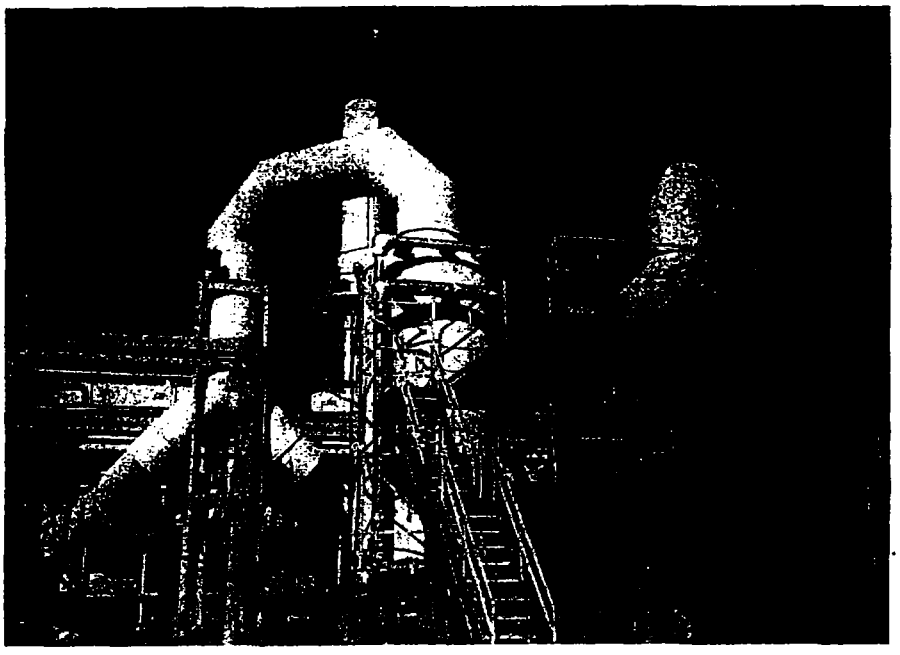


To conduct this type of sampling, CEI staff fabricated a unique hollow core hand sampling sediment device. Sampling work plans receive prior approval by IEPA and USEPA. Virtually all of the clay material dredged from Lake Calumet has been beneficially reused for landfill capping and related environmental construction in the area. Approximately 500,000 cubic yards have been used to cap an abandoned municipal landfill at the north end of Lake Calumet, which was subsequently developed into the Harborside International Golf Complex.



RCRA Facility Investigation (Phase I, II, III)
Chicago, Illinois

The subject site is located on a 27-acre pier extending 2,500 feet out into Lake Calumet on Chicago's southeast side. The site operates as an industrial waste treatment and handling facility under a RCRA Part B permit. Provisions of the permit require the operator to conduct a facility investigation to determine if "corrective action" is required to manage waste or product releases into the environment. Since January of 1995, CEI has been conducting a comprehensive investigation of soil and ground water conditions under IEPA-approved work plans. To date, over 500 soil samples have been collected and analyzed in a multi-phase investigation to define the nature and extent of contamination at the facility.



CARLSON ENVIRONMENTAL, INC.

Bank One
CenterPoint Properties Trust
Chicago Academy of Sciences
Clean Harbors
Coach & Car Equipment Corp.
Cole Taylor Bank
Colliers Bennett & Kahnweiler, Inc.
Comerica Bank
Cozzi Iron & Metal
Dominick's Finer Foods
Eagle Foods Incorporated
Harris Bank & Trust
Illinois Housing Development Authority
Illinois International Port District
Knight Architects, Engineers & Planners
LaSalle National Bank
The Levy Organization
Libbey-Owens-Ford
Loctite Corporation
Morgan Realty Partners
Production Tool
Public Building Commission of Chicago

Soil and Ground Water Investigations

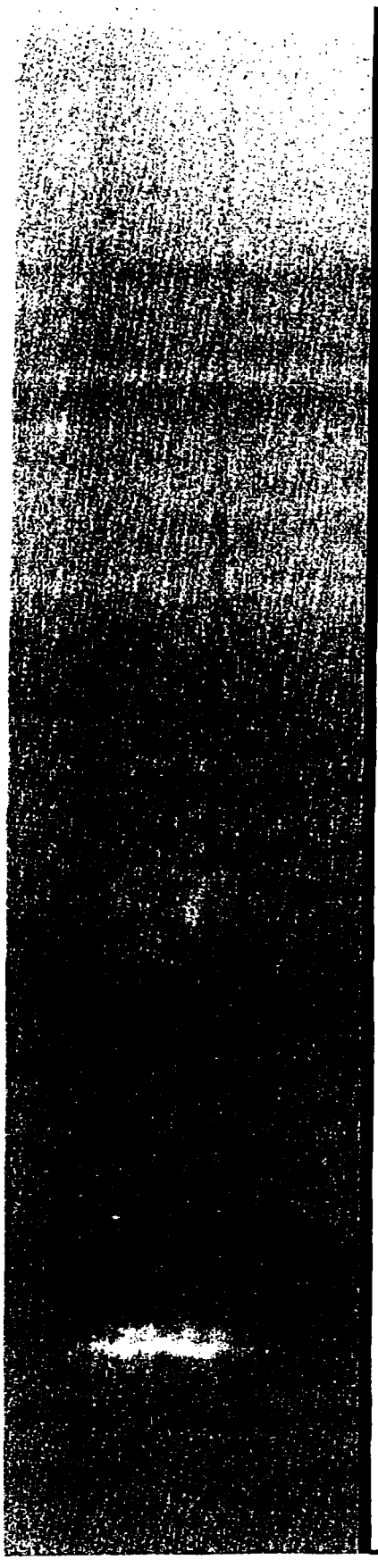
Representative Clients

Escast, Inc.
Fansteel, Inc.
Fidelity Mutual Life Insurance Co.
First National Bank of Chicago
Foster Bank
Freuhauf Trucking
General Motors Acceptance Corp.
GLS Corporation
Glass Specialty Companies
Reed Chatwood, Inc.
The RREEF Funds
Robertson Ceco Corp.
Rubloff Development Group, Inc.
The Mirage
Soft Sheen Products, Inc.
United Parcel Service
Village of Riverdale
Walsh Higgins & Co.
Wesley-Jessen Corporation

CARLSON ENVIRONMENTAL, INC.

Section 4

Underground Storage Tank Removal & Cleanup



underground storage tanks

Federal and State regulations impose strict upgrading requirements on existing tank systems as well as design and operating standards for new tanks. Moreover, tanks no longer in use or leaking generally must be removed from the ground or abandoned in place. Contaminated soils or ground water must be cleaned up to acceptable levels.

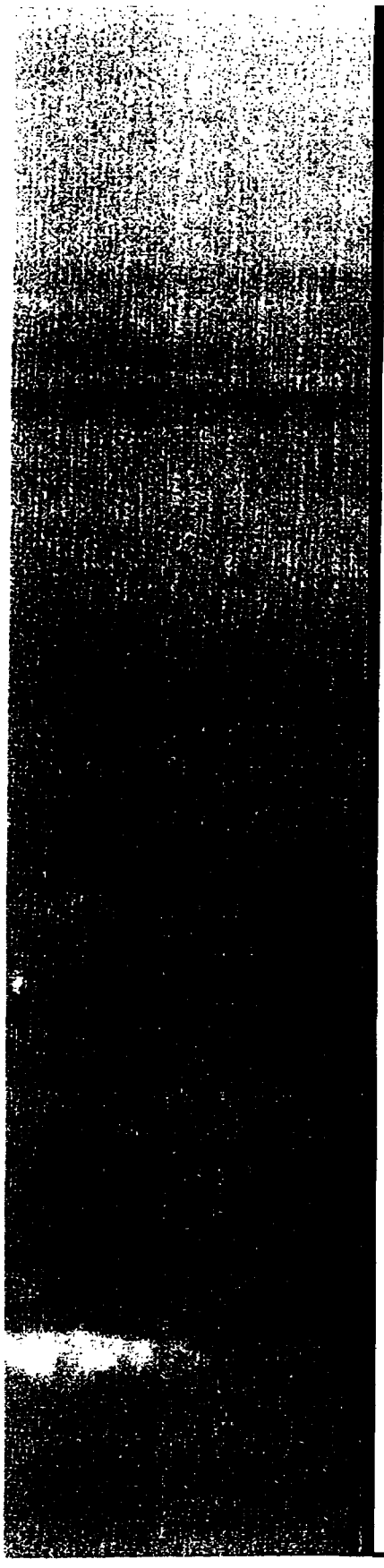
- CEI conducts site investigations to determine if leaks have occurred; designs remediation programs for contaminated soil and/or ground water; oversees tank removals; and prepares State reimbursement applications.

- CEI also assists clients in obtaining "closure" letters from State regulatory agencies certifying that no additional cleanup is required at a site. This typically allows buyers and lenders to close transactions knowing that there is no substantial threat of further cleanup demands by the government.

CARLSON ENVIRONMENTAL, INC. *Project Experience*

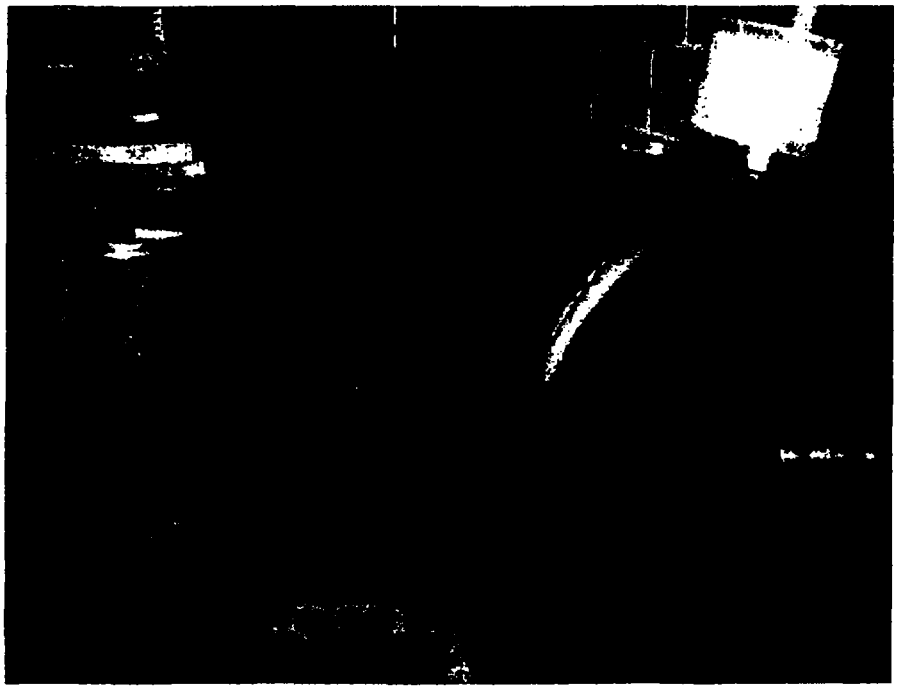
In 1990, CEI began investigations for the presence of USTs at nine branch bank sites in and around Chicago. USTs were discovered at six of the locations. CEI provided oversight for the removal of tanks and contaminated soils at three sites. Formal closure letters have been obtained from the EPA for each of these sites. The [illegible] sites are [illegible] 1999.

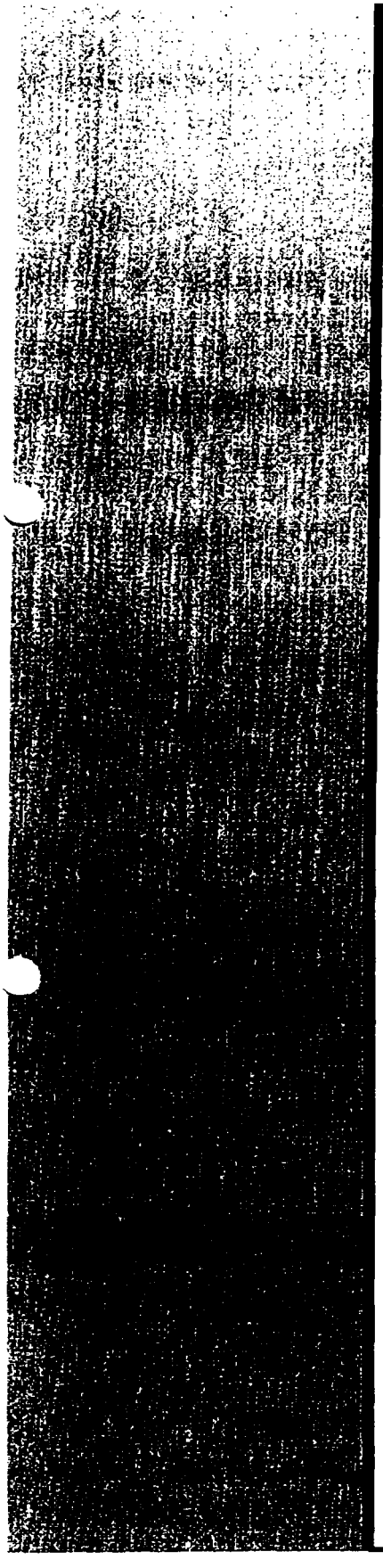
UST Investigation, Removal and Closure
Chicago and Evanston, Illinois
1990 to 1999



UST Investigations at 25 Sites
Skokie, Prospect Heights and Wheeling, Illinois
February 1996

At the request of the Client, CEI conducted regulatory database reviews and site inspections at 25 commercial property locations to determine if USTs were present, or if other site activities could result in waste or product releases to the environment. Initial site inspections were followed by soil sampling at selected sites to evaluate the nature and extent of suspected contamination.





CARLSON ENVIRONMENTAL, INC.

Underground Storage Tank Removal & Cleanup

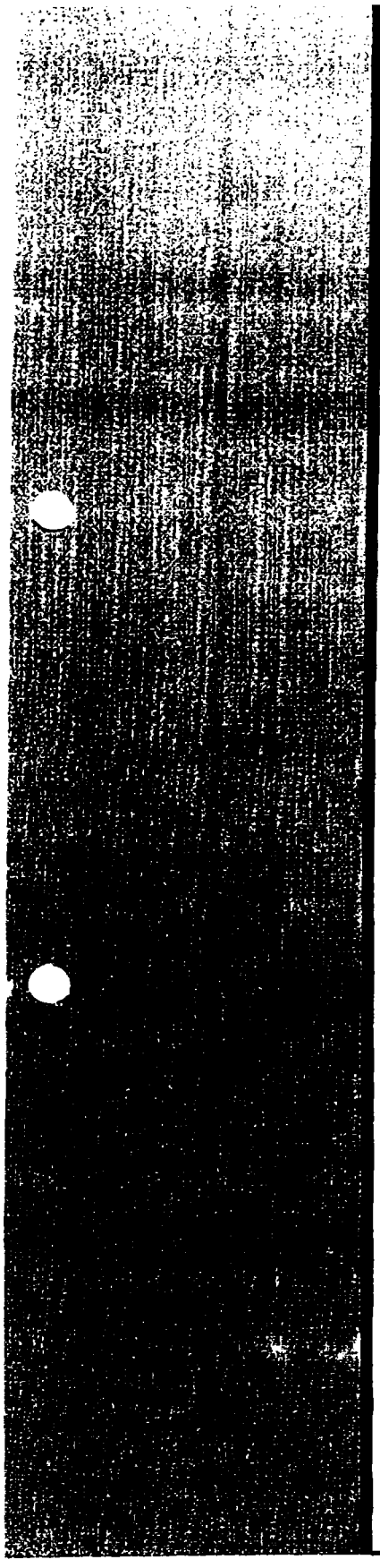
Representative Clients

Aeropres, Inc.
Beatrice Company
Browning-Ferris Industries
Carol Stream Ice Arena
CB Commercial
CenterPoint Properties Trust
Chicago Academy of Sciences
Chicago Lock Company
Citibank
City Insulation Company
Cole Taylor Bank
Colliers, Bennett & Kahnweiler, Inc.
Comerica Bank
Corn Products
Cozzi Iron & Metal
Crescent Electric
Donahue's Truck Plaza
Downers Grove Ice Arena
Earl Scheib, Inc.
Enterprise Rent-A-Car
Fansteel, Inc.
FCL/Stava
Fidelity Mutual Life Insurance
Fields Saab, Inc.
Finishing Plus, Inc.
First National Bank of Chicago
Foster Bank
Freuhauf Trucking
General Motors Acceptance Corp.
Glass Specialty Companies
Griffith Laboratories
Hallmark Mailing Services, Inc.
Harris Bank & Trust
Hillcrest Healthcare Center, Inc.
HSA, Inc.
IEI Barge, Inc.
Illinois Federal Savings and Loan
Kendal Container Company
Korea First Bank
Lake Shore Athletic Club
LaSalle National Bank
Loctite Corporation
Louis A. Weiss Memorial Hospital
Marquette National Bank
Mancuso Cheese Company
Morgan Realty Partners
NBD Banks
Northern Builders/Rogers Leasing
Peacock Oil Company
Remin/Karta-A-Bag
RN Realty
The RREEF Funds
Soft Sheen Products
Tirapelli Ford, Inc.
Tommy Armour Golf
Village of Oak Park
Village of Riverdale

CARLSON ENVIRONMENTAL, INC.

Section 5

Site Cleanup Programs



CARLSON ENVIRONMENTAL, INC.

site cleanup programs

Facilities regulated under various Federal and State programs (e.g. RCRA, CERCLA) may be required to cleanup contamination created by current or historical waste management practices. These cleanup programs typically involve soil and/or ground water remediation. Property owners, as well, may be compelled to address environmental issues to satisfy buyers or financial institutions.

- CEI has extensive experience in managing a wide variety of cleanups involving contaminated soil and ground water, as well as asbestos and lead paint abatement.

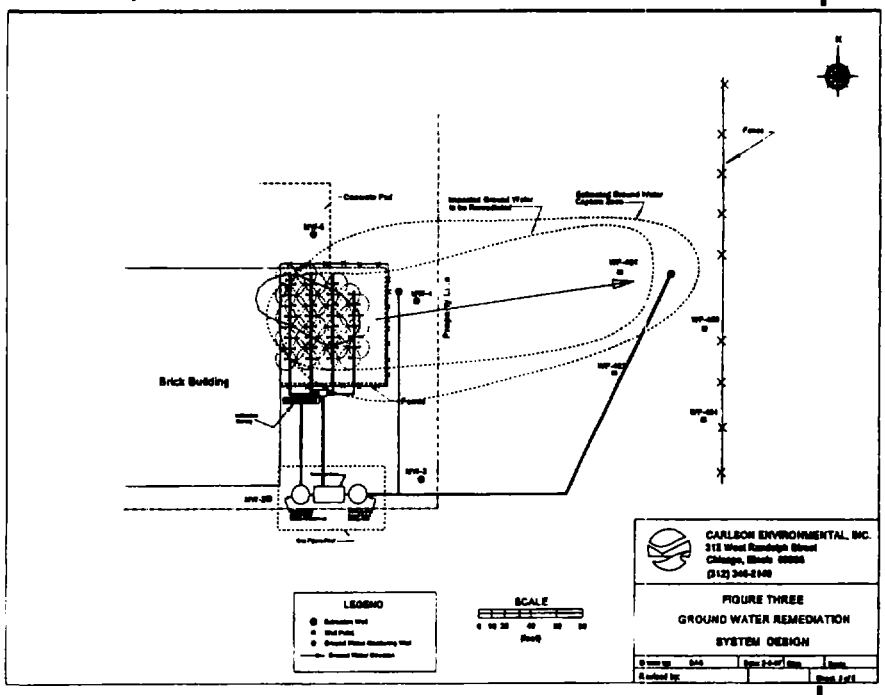
- CEI offers clients total project management capabilities from conceptual design to the procurement of closure letters from State regulatory agencies.

- CEI will define or confirm the extent of contamination through sampling programs and building inspections; prepare risk assessments; prepare bid specifications; and manage or coordinate remediation, abatement or decontamination services.

Soil Vapor Extraction/Ground Water Pump and Treat

Degreasing operations and drum storage of waste solvents over a period of years resulted in releases of chlorinated solvents into soil and ground water at this four-acre industrial site occupied by a 33,000 square foot building. A pilot test conducted by CEI in 1995 demonstrated that soil venting, in conjunction with ground water pumping and treatment methods will effectively remove solvents in the soil and ground water at the site. A work plan for implementing a full scale system was submitted to, and approved by the IEPA.

Mundelein, Illinois



Automobile Dealership
Chicago, Illinois

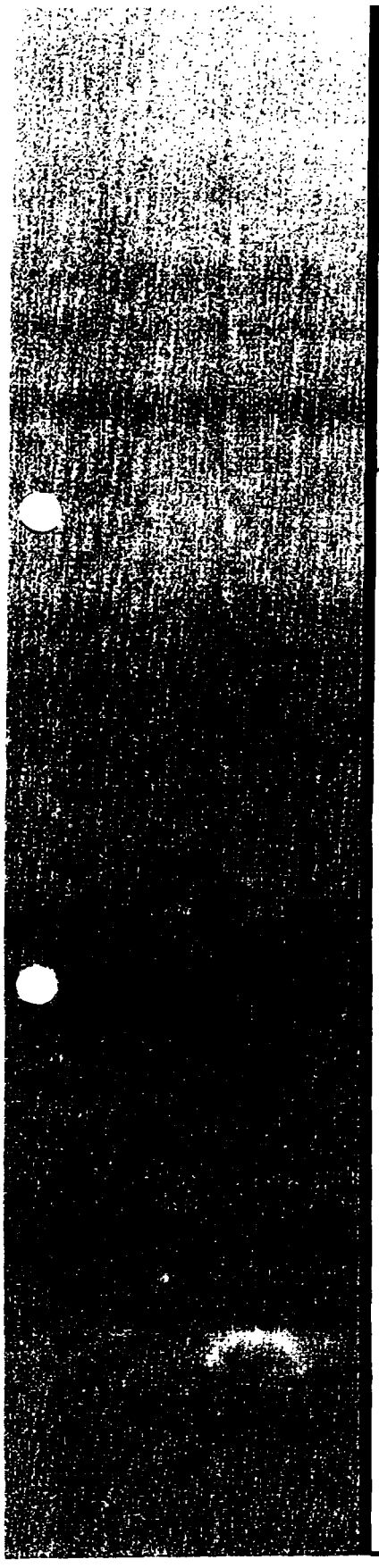
July 1994

In preparation for the sale and redevelopment of the site, a former automobile dealership, CEI removed two underground storage tanks; excavated and disposed of a small quantity of contaminated soils; removed all hydraulic lifts and associated piping; steam-cleaned sewers and catch basins underneath the site building; and removed all asbestos-containing building materials. The site was subsequently sold and redeveloped into a branch banking facility.

CARLSON ENVIRONMENTAL, INC.

Environmental Permitting & Compliance Programs

Section 6



CARLSON ENVIRONMENTAL, INC.

environmental permitting & compliance programs

Companies that are developing or expanding manufacturing operations often require assistance in obtaining permits from regulatory agencies. In addition, changes in Federal and State laws frequently subject existing facilities to new permitting requirements.

CEI provides assistance to industry in meeting permit requirements for air, water, hazardous and solid waste. CEI staff develops the technical data necessary to complete permit applications; meets with regulatory agency staff to negotiate specific permit conditions; and designs control and compliance systems to satisfy permit requirements.

To address concerns about compliance enforcement, CEI will conduct liability assessments and facility and process evaluations to identify issues and develop compliance strategies.

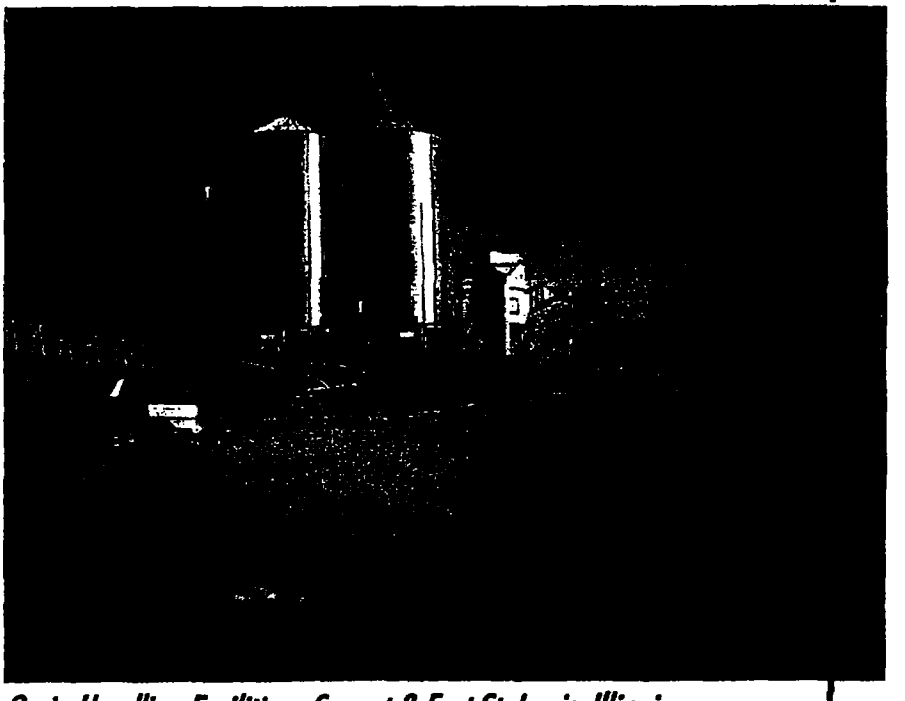
Air Pollution Modeling for Contingency Planning
Chicago, Illinois
1994 to 1995

The Client operates an industrial waste treatment, storage and handling facility. The facility's RCRA permit requires documentation of emergency response procedures, including the computer modeling of potential air pollution hazards that may result from a release, fire or explosion. CEI was retained to conduct the modeling utilized in evaluating the effects of these "worst case" scenarios.

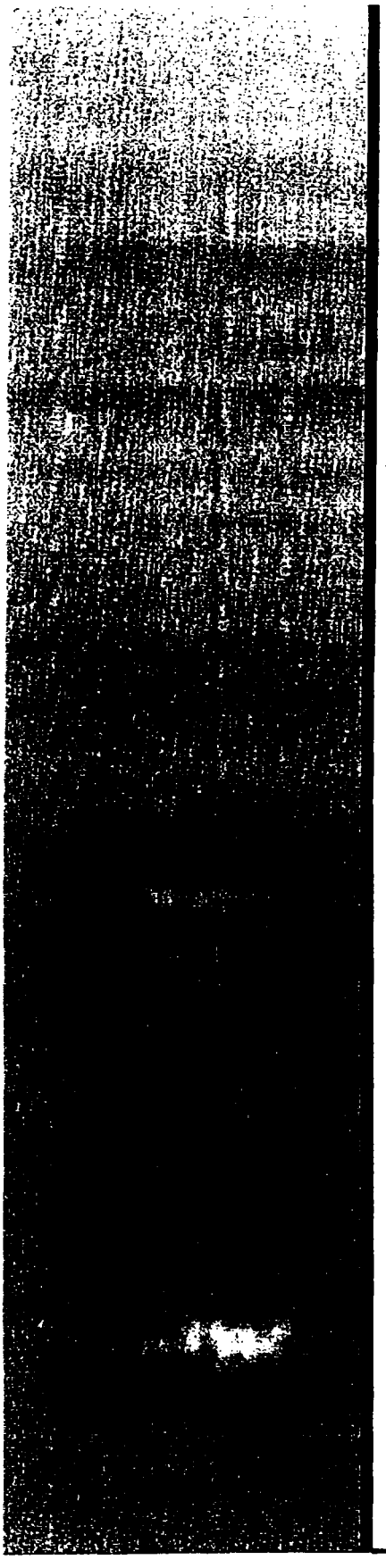
CEI used this model to develop an assessment of the possible hazards that may result from a release, fire, or explosion. This required an estimation of the quantities and types of gases that could be generated. The modeling also assessed the effects of wind speed, atmospheric stability class, and atmospheric temperature on ambient air quality levels.

Compliance Program
June 1995 to February 1996

CEI performed an environmental audit and compliance review of two grain handling facilities located on or near the Mississippi River. The project included a walk through inspection and document review at the facilities. CEI formulated a detailed schedule of those actions needed to bring the facilities into compliance. This schedule included the preparation of 1994 and 1995 air emissions reports; a general housekeeping checklist; preparation and submission of a permit to the Illinois Department of Agriculture (IDOA) to handle and store dry bulk fertilizers; and preparation of Federally Enforceable State Operating Permits (FESOPs) to address air pollution.



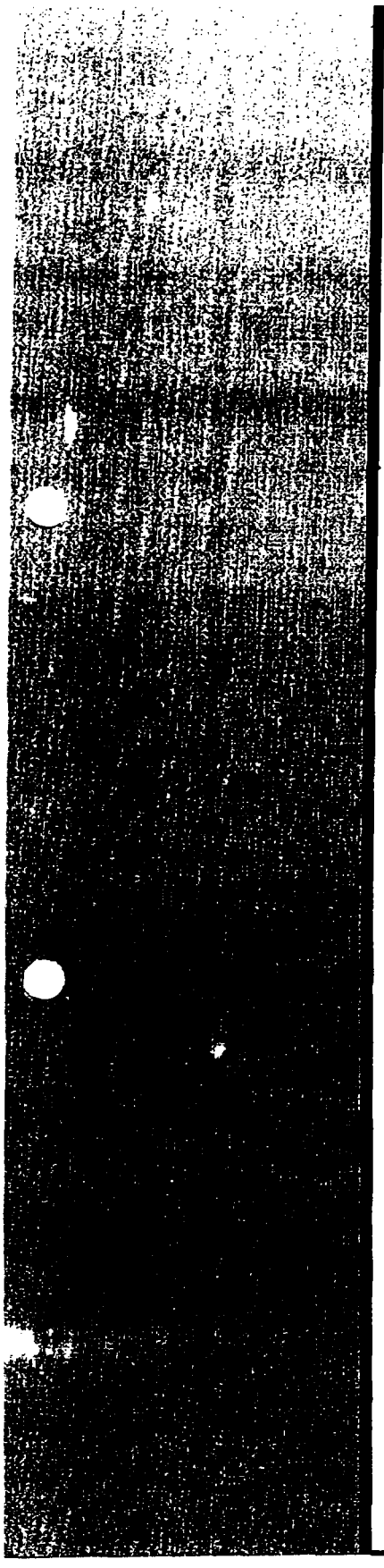
Grain Handling Facilities - Sauget & East St. Louis, Illinois



CARLSON ENVIRONMENTAL, INC.

Section 7

Litigation Support



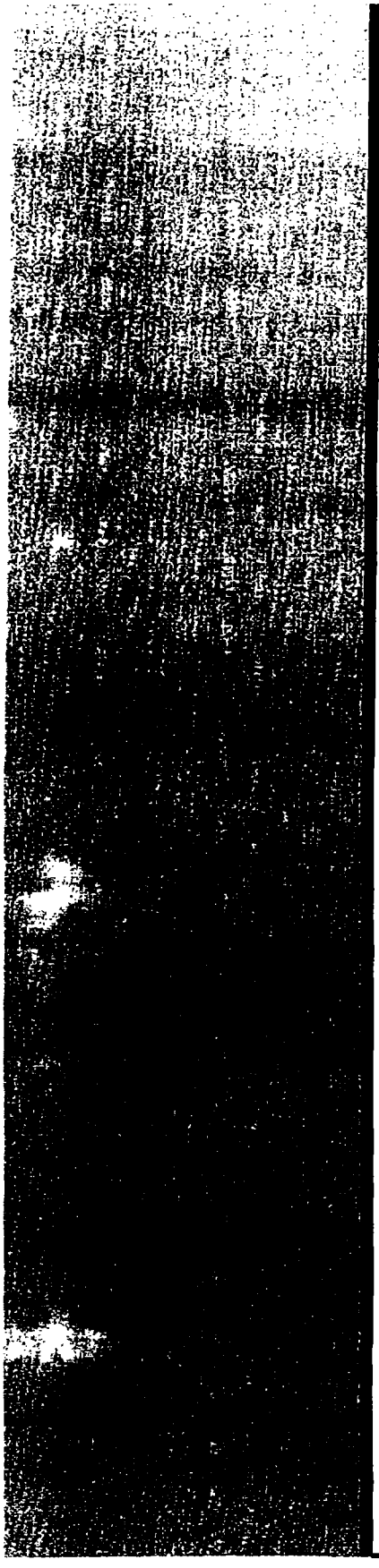
litigation support

Attorneys involved in environmental and toxic torts litigation often need scientific and technical support in developing effective litigation strategies. Such assistance involves a wide variety of scientific disciplines as well as a sophisticated knowledge of how regulatory agencies work.

- CEI staff can assist counsel in developing strategies to maximize the amount of information revealed during discovery; screen, review and organize documents.

- CEI will develop effective presentations of scientific and technical data, and provide "insider" understanding of the operation of Federal and State environmental agencies.

- CEI staff can also provide expert witness testimony in judicial and administrative hearings. Individual staff experience is outlined on the following pages.



Richard J. Carlson

Jiffy Lube International v. The Southland Corporation (91 L 11220)

The Pulaski Venture v. Westinghouse Electric Corporation (91 C 3490)

Fansteel, Inc. v. Estronics et. al. (90 MR 355)

Mod-Tek, Inc. v. Lincoln Publishing (89 L 193)

Peter Engelland v. Clean Harbors, Inc. (94 L 11385)

Al Piemonte Dodge, Inc. v. Chrysler Motors Corporation (94 L 15469)

Alfred J. Paoletti v. Karr Cleaners, Inc. et. al. (94 L 0599)

Truck Components, Inc. and Brillion Iron Works, Inc. v. Beatrice Company, Hunt-Wesson et. al. (94 C 3228)

In re: Energy Cooperative, Inc. (81 B 5811)

People of the State of Illinois v. Arnold Enterprises (93 CH 1345)

Dayton Hudson v. Cardinal Industries, et al.

Edward E. Garske

Prentiss Properties Acquisition Partners v. Theodore Ignasiak, et al. (93-C-1368)

Chicago Transparent Products , Inc. v. American National Bank and Trust Company, as Trustee under Trust Nos. 25628 and 25629 (90 CH 9069)

Nicholas J. Murlas Living Trust, et al. v. Mobil Oil Corp., et al. (93 C 6956)

LaSalle National Bank v. American Hydraulics, Inc. and MNP Corporation (89 C 3532)

Kenneth W. James

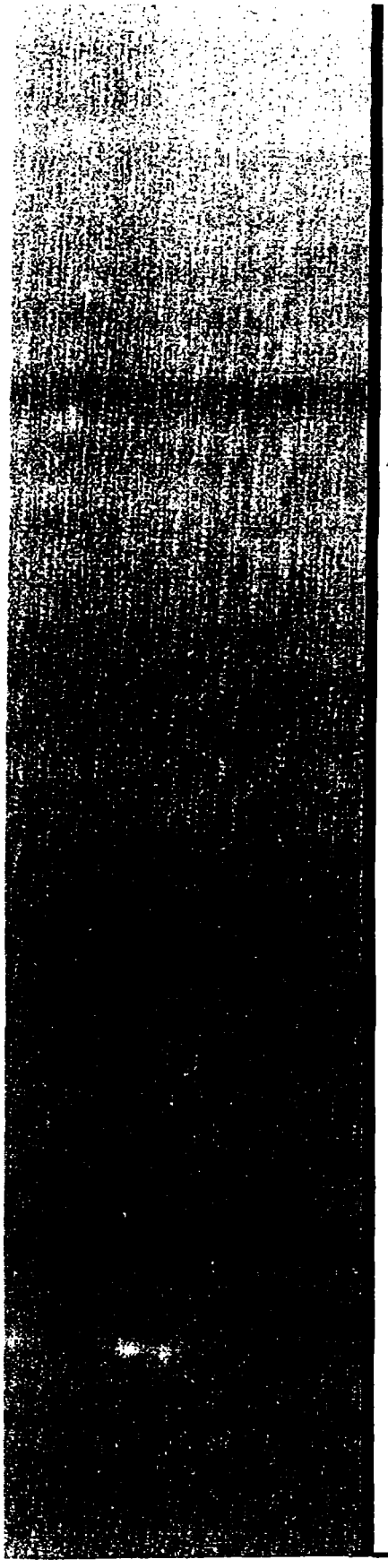
Jiffy Lube International v. The Southland Corporation (91 L 11220)

Alfred J. Paoletti v. Karr Cleaners, Inc. et. al. (94 L 0599)

People of the State of Illinois v. Challenger Manufacturing, Inc. (96 CH3238)

Mankoff, Inc. v. HSA, Inc. (94 CH 1737)

Village of Rosemont v. Peacock Oil



CARLSON ENVIRONMENTAL, INC.

Thomas J. Swabowski
Bischoff Maurides & Swabowski, Ltd.
(312) 427-2600

Daniel Jarlenski
McGrath, North, Mullin & Kratz, P.C.
(402) 341-3070

Clifton A. Lake
McBride, Baker & Coles
(312) 715-5765

Jay A. Steinberg
Hopkins & Sutter
(312) 558-5186

Nicholas J. Parolisi, Jr.
Bullaro, Carton & Stone
(312) 831-1000

Joseph Wright
McBride, Baker & Coles
(312) 715-5700

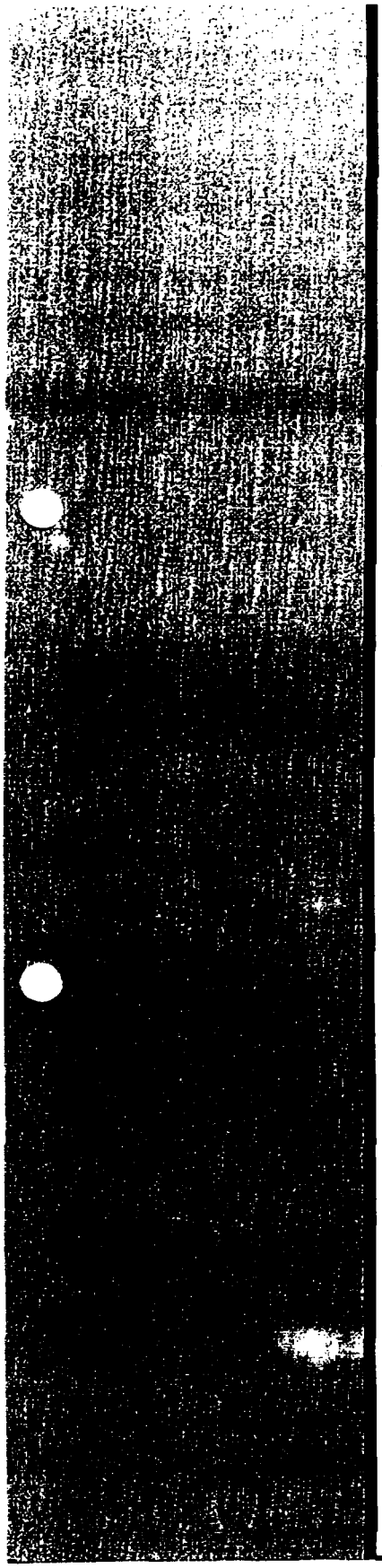
Peter Zamis
Rathje, Woodward, Dyer & Burt
(630) 668-8500

Daniel J. Biederman
Hinshaw & Culbertson
(312) 704-3071

Eugene J. Frett
Sperling, Slater & Spitz
(312) 641-3200

Litigation Support

Representative Clients



CARLSON ENVIRONMENTAL, INC.

Insurance Coverage

Section 8

CARLSON ENVIRONMENTAL, INC.

Profiles

Section 9

CARLSON ENVIRONMENTAL, INC.

Richard J. Carlson

President

- Represents clients in negotiating permits, compliance orders and consent decrees with Federal and State regulatory agencies.
- Manages environmental compliance audits and assists with the development of compliance management systems.
- Manages environmental assessments of a wide variety of commercial and industrial facilities for real estate transactions, mergers, and acquisitions.
- Provides expert testimony in support of various environmental litigation matters on behalf of clients.

education

Doctor of Philosophy, Public Administration, University of Illinois

Master of Science, Communications, University of Illinois

Bachelor of Science, Communications, University of Illinois

selected professional activities

- Co-chair, Environmental Control Committee, Chicagoland Chamber of Commerce, 1988-1993.
- Staff Chair, Task Force on Global Climate Change, National Governors' Association, 1989-1990.
- Director, Illinois Asbestos Abatement Authority, 1988.
- Commissioner, Ohio River Valley Water Sanitation Commission, 1981-1988.
- Member, Water Quality Board, International Joint Commission, 1985-1988.
- Chair, Great Lakes Environmental Administrators, 1987-1988.

CARLSON ENVIRONMENTAL, INC.

Edward E. Garske

Vice President

- Manages all field operations.
- Directs business management programs and related staff.
- Supervises all project-related activities and project management.

Project Director

- Supervises underground storage tank removals, including the remediation of contaminated soils and ground water.
- Has conducted over 600 environmental site assessments.
- Provides oversight for a wide range of remedial action projects.

Has managed projects involving building inspections to identify and sample asbestos-containing building materials (ACBM), quantify ACBM, prepare bid documents, assist in contractor selection and oversee project management.

education

Bachelor of Science, Water Chemistry, University of Wisconsin

registrations / certifications

40-Hour OSHA 29CFR1910.120 HAZWOPER

AHERA Asbestos Building Inspector & IDPH Licensed

Certified Hazardous Materials Manager (CHMM) - Master Level

CPR and First Aid Training

CARLSON ENVIRONMENTAL, INC.

CEI is capable of assisting you with all of your environmental consulting and engineering needs. If we can be of service to you, or you would like more information about our firm, please do not hesitate to contact us at our corporate office.

65 East Wacker Place

Suite 1500

Chicago, Illinois 60601

TELEPHONE: (312) 346-2140

FAX: (312) 346-6956

ENVIRO-DYNAMICS, LLC
1310 Delaware Street
Hobart, Indiana 46342
Phone: (219) 947-5839
Fax: (219) 947-5903

Fax

To: JOHN JACKSON **From:** Rob Mores

Company: Fansteel **Date:** 11-19-00

Fax: 847-688-4555 **Pages:** 6 (including cover)

Re: Company Information - Per Your Request

☐ Urgent ☒ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

ENVIRO-DYNAMICS, LLC
1310 Delaware St., Hobart, IN 46342
Phone: 219-947-5839
Fax: 219-947-5903

November 20, 2000

Mr. John Jackson
Fansteel, Inc.

RE: COMPANY INFORMATION
Direct Push Probing Services

Dear John:

As a follow-up to your recent request, I would like to take this opportunity to provide you with some information about our company for your files. Included is a copy of our company brochure, a resume, and a client reference list. The brochure summarizes our capabilities and the applications of direct push probing technology.

If you require any additional information, please do not hesitate to contact me at (219) 947-5839.

Sincerely,
ENVIRO-DYNAMICS, LLC

Robert J. Mores

Robert J. Mores, CHMM
Principal

Enclosures

ROBERT J. MORES, CHMM
Principal/Executive Manager

FIELDS OF EXPERTISE:

Subsurface Investigations, Contamination Delineation, Environmental Assessments, Underground Storage Tank Management, (UST) Construction Management, RCRA Waste Management and Permitting

PROFESSIONAL SUMMARY:

Mr. Mores is a Principal and founder of ENVIRO-DYNAMICS, LLC (ENVIRO-DYNAMICS) ENVIRO-DYNAMICS is an environmental contractor that provides soil, soil gas, and groundwater sample collection services utilizing direct-push probing equipment. Mr. Mores is involved in every aspect of ENVIRO-DYNAMICS' operations, including: business development; project costing; proposal preparation; accounting; and company profitability. He also operates the probe units and performs the field work during most every project performed by ENVIRO-DYNAMICS.

Prior to founding ENVIRO-DYNAMICS, Mr. Mores developed over ten years of applied experience in exploration and remediation at RCRA, hazardous waste, and leaking underground storage tank sites. Also, he has been involved in every aspect of UST management. Mr. Mores has extensive knowledge in the design and installation of UST systems. He has managed projects involving subsurface contamination assessments, site remediation, regulatory correspondence, and hazardous waste disposal and transportation. He is also responsible for performing and managing environmental site assessments, soil and groundwater sampling, and directing analytical testing.

SELECT PROJECT EXPERIENCE:

Mr. Mores has been a Project Manager for over 50 UST closure projects for a major utility company in Illinois. Performed subsurface investigations to check for potential contamination at each site. Supervised the excavation and removal of UST systems and contaminated soils performed by various contractors. Designed remedial plans at contaminated sites. Also responsible for regulatory correspondence and permitting.

He has been a Project Manager on an UST service contract with a major utility company in New England. This included UST closures at over 40 sites, soil and groundwater remediation, and emergency response for various types of petroleum related spills. Also provided technical assistance on compliance issues concerning USTs and managed state-wide UST upgrade programs.

He has been a Project Manager on an UST replacement project involving three 10,000 gallon UST systems used for an emergency backup power source at a critical government facility. Duties included supervision and oversight of a high exposure project with many critical phases under limited time frames.

Mr. Mores was the Project Manager during a hydrogeologic investigation at a landfill in Illinois. This involved managing the installation of a groundwater monitoring well network used to study the hydrogeologic characteristics of the bedrock formation below the landfill and to monitor for possible groundwater contamination. Also prepared closure/post-closure care plans, permit applications, and various reports submitted to the Illinois EPA.

ENVIRO-DYNAMICS, LLC
1310 Delaware Street
Hobart, IN 46342
(219) 947-5839
Fax (219) 947-5903

SELECT PROJECT EXPERIENCE (con't):

He has been a Project Manage for the design and implementation of a soil vapor extraction (SVE) system used to prevent volatile and semi-volatile organic vapors emitting from contaminated soils from entering into the basement of a public facility. Air monitoring within the basement indicated the system effectively removed previously found vapors below detectable levels or permissible regulatory levels.

Mr. Mores has been a Project Manager for the investigation and remediation of various hazardous materials including 1,1,1-Trichloroethane and acid wastes containing several heavy metals. Also provided project oversight during the removal of two 40,000 gallon underground storage tanks in a confined area with many structural concerns

He has been a Project Manage during a closure of a solid waste landfill in Illinois. Duties included preparation and evaluation of contractor bids, oversight and CQA documentation during construction of final cover system in accordance with the IEPA approved closure plan and preparation of closure certification report.

He has been a Project Manage during closure of a RCRA surface impoundment in Indiana. Duties included oversight, management and CQA documentation during the installation of a RCRA final cover system and preparation of the closure certification report, management of the facilities groundwater monitoring program, management and preparation of a RCRA Part B post-closure permit application.

EDUCATION:

B.A Environmental Studies with a minor in Earth Science, Northeastern Illinois University

CERTIFICATIONS/TRAINING:

Certified Hazardous Materials Manager (CHMM)
40-Hour OSHA HAZWOPER with 8-Hour Refresher Training

PUBLICATIONS:

Contributing Author "Recent Developments Regarding Underground Storage Tanks After PA88-496 (HB300), " The Chicago Bar Association Conference on Environmental Matters Affecting Real Estate: New Developments, January 11, 1994.

PROFESSIONAL AFFILIATIONS:

National Groundwater Association
American Institute of Professional Geologists
Institute of Hazardous Materials Management

ENVIRO-DYNAMICS utilizes direct push equipment to provide soil, soil gas and groundwater sampling services. Direct push sampling has proven to be an economical and efficient alternative to conventional auger drilling techniques. Additionally, there is minimal site disturbance and no auger cuttings are generated during sampling.

ENVIRO-DYNAMICS provides direct push services with Geoprobe® soil probing units, including:

- ✓ Geoprobe® Model 5400 mounted in a 4x4 pick-up truck
- ✓ Geoprobe® Model 54DT track-mounted probe

The Model 5400 is well suited for most projects while the Model 54DT is very compact and versatile with the ability to sample in a variety of locations, including: muddy or unstable ground, inside or between buildings, and low clearance areas. Depending upon specific project requirements or the clients needs, other Geoprobe® units can be made available.

ENVIRO-DYNAMICS is owned and operated by a former environmental consultant with over ten years experience in environmental industry. We anticipate our clients needs and are eager to see that those needs are met. Because ENVIRO-DYNAMICS provides services to environmental professionals, we understand the importance of maintaining professionalism in all aspects of our business.

ENVIRO-DYNAMICS can provide direct push soil, soil gas and groundwater sampling services on a variety of projects, including:

- ✓ Environmental Site Assessments
- ✓ UST Closures
- ✓ Property Audits
- ✓ Brownfield Investigations
- ✓ Hydrogeologic Assessments
- ✓ Superfund Investigations
- ✓ RCRA Facility Investigations
- ✓ Remedial Investigation/Feasibility Studies

Direct push sampling methods are recognized by the USEPA and many state regulatory agencies as an approved method of investigation. In addition to direct push sampling services, ENVIRO-DYNAMICS can use direct push methods for the following applications:

- ✓ Installation of Small Diameter RCRA Quality Groundwater Monitoring Wells
- ✓ Soil Vapor Extraction
- ✓ Air Sparging
- ✓ Bioremediation/Oxygen Release Compound (ORC) Injection

The following Standard Fee Schedule is provided to outline the rates charged for our services.

STANDARD FEE SCHEDULE

I. Probing Rates

Truck Unit and Operator	$850/day
	$105/hour
54DT Unit and Operator	$900/day
	$115/hour
Unit and Two Man Crew	$1,000/day
	$125/hour

Note: A four hour minimum will apply to all hourly projects.

II. Mobilization/Travel

Mob/Demob (w/in 50 miles)	$100/day
Unit Rate Mileage	$0.75/mile
Per Diem (per person)	$75/night

III. Sampling Materials

1. Plastic Soil Sample Liners	
Large Bore/Macro-Core	$0.70/l.f.
Dual-Tube	$0.90/l.f.
2. Vinyl End Caps	
Large-Bore	$0.30/pair
Macro-Core	$0.65/pair
Dual-Tube	$0.55/pair
3. SP15 Expend. Points for Groundwater Sampling	$6.50/ea
4. Polyethylene Tubing	$0.15/l.f.
5. Granular Bentonite	$9.00/bag

Note: All other materials and supplies will be quoted on a per project basis.
For additional information or a project specific quotation, please contact:

ENVIRO-DYNAMICS, LLC
Robert J. Mores, CHMM
1310 Delaware St.
Hobart, IN 46342
Ph: 219-947-5839 Fax: 219-947-5903

ENVIRO-DYNAMICS, LLC *provides soil, soil gas, and groundwater sampling services in a professional and economical manner*

COMPANY OVERVIEW

Probing Units

- ✓ *Geoprobe® Model 5400 Mounted in a 1998 Dodge Ram 4x4 Pick-up*
- ✓ *Geoprobe® Model 54DT Track-Mounted Probe*

Soil Sampling

- ✓ *Geoprobe® 24-inch long Large-Bore (LB) Sampler*
- ✓ *Geoprobe® 3-foot, 4-foot, and 5-foot long Macro-Core (MC) Samplers*
- ✓ *Geoprobe® Dual-Tube (DT) Sampling System for continuous sampling at 2-foot, 3-foot and 4-foot intervals*

Groundwater Sampling

- ✓ *Geoprobe® Mill Slot Sampler*
- ✓ *Geoprobe® Screen Point 15 (SP15) Groundwater Sampler*
- ✓ *½-in., ¾-in., 1-in., and 2-in Diameter Groundwater Monitoring Wells*
- ✓ *Geoprobe® Pre-packed Screen Monitoring Wells*

Other Capabilities

- ✓ *Soil Gas Sampling*
- ✓ *Installation of Air Sparing/Soil Vapor Extraction Wells*
- ✓ *Oxygen Release Compound (ORC) Injection*

For additional information, refer to the inside of the brochure or please call:

ENVIRO-DYNAMICS, LLC
1310 Delaware Street
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Fax: (219) 947-5903

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Phone: 219-947-5839
Fax: 219-947-5903

ENVIRO-DYNAMICS, LLC
ENVIRONMENTAL PROBING SERVICES

1310 Delaware Street
Hobart, IN 46342

ENVIRO-DYNAMICS, LLC
1310 Delaware St., Hobart, IN 46342
Phone: 219-947-5839
Fax: 219-947-5903

CLIENT REFERENCE LIST

Weaver Boos & Gordon, Inc. 200 S. Michigan Avenue, 9th Floor Chicago, IL 60601 **Contact:** Mr. Doug Dorgan **Phone:** (312) 922-1030	**ENMARC** P.O. Box 578 Lemont, IL 60439 **Contact:** Ms. Jeanette Virgillio **Phone:** (630) 257-9357
Terracon, Inc. 135 Ambassador Drive Naperville, IL 60540 **Contact:** Mr. Matt Carlin **Phone:** (630) 717-4263	**HydroTech Corporation** 1106 Meridian Plaza, Suite 340 Anderson, IN 46106 **Contact:** Mr. Cory Smith **Phone:** (765) 642-1581
Tri-Media Consultants, Inc. 1900 Industrial Parkway Marquette, MI 49855 **Contact:** Mr. Tom Anthos **Phone:** (906) 228-5125	**K-Plus Environmental, Inc.** 921 W. Van Buren, Suite 100 Chicago, IL 60607 **Contact:** Mr. Dan Caplice **Phone:** (312) 226-4400
ENSR Corporation 27755 Diehl Road Warrenville, IL 60555 **Contact:** Mr. Dave Schumacher/Scott Adner **Phone:** (630) 836-1700	**Environmental Incorporated** 2308 Sturdy Road Valparaiso, IN 46383 **Contact:** Mr. Tom Stevenson/Mike Palm **Phone:** (219) 462-7576

Mid-America
DRILLING SERVICES, INC.

700 Hicks Drive • Elburn, IL 60119-9059
Phone (630) 365-0600 • Fax (630) 365-6830 • Toll Free (877) 587-9600 • www.madrilling.com

November 16, 2000

Mr. John Jackson
Fan Steel
Number One Tantalum Place
North Chicago, Illinois 60064

Dear John:

It was good to speak with you on the telephone today. I am forwarding to you some general information about Mid-America Drilling Services, Inc (Mid-America) for your files. A summary of our company and capabilities is outlined in the paragraphs below. I hope that this information gives you a good picture of our company and how we can help you with any projects which you may need assistance in the near future!

Mid-America strives to provide quality environmental and geotechnical services and client satisfaction. In just two years, we have grown to a company of almost twenty employees with five drill rigs and three direct-push Geoprobe® units and a number of support vehicles. Our staff experience combines for a total of over 35 years in the drilling industry.

Mid-America has the capability of providing the following drilling services: hollow-stem augering, mud/water rotary, rock bit/rock coring, and direct push (Geoprobe®). Our equipment fleet includes standard truck-mounted equipment and our special ATV rubber-track combo rig, which has the capabilities to perform *all* of the above listed drilling techniques. Additionally, Mid-America can provide test pit and excavation services on specific projects when requested. A couple of inserts showing photographs of some of our equipment are attached.

Our company has worked extensively at various RCRA, CERCLA/Superfund, UST/LUST, Voluntary Clean-up, and Phase I & II sites. When working on these types of projects the sites locations include municipal and special waste landfills, chemical and petroleum refineries/terminals, retail gasoline stations, dry cleaners, rail yards, undeveloped property and various other urban and rural locations.

Mid-America currently services a strong client base in the Midwest Region particularly Illinois, Indiana, Wisconsin, and Michigan. We also have completed projects in Iowa, Missouri, Minnesota and Ohio and occasionally have drilled as far as Colorado. Mid-America will mobilize anywhere in the U.S. dependent upon the size and scope of the project and permitting that there are no conflicts with local regulations.

A brief description of key personnel is included on page two of the Qualifications brochure included with this letter. We provide all of our field employees with OSHA 40-hour Hazardous Site Worker training and the annual 8-hour refresher course. We emphasize safe work practices and require our employees to hold a valid commercial driver's license (CDL) in order to drive our vehicles.

If you have any further questions about our company, please do not hesitate to contact Mike Crimaldi, Gerry Kraemer or myself at you convenience, or visit our website at www.*madrilling.com*. I look forward to speaking with you again in the near future.

Sincerely,

Mid-America Drilling Services, Inc.

K. Kyle Arney P.G.
Client Services Manager

Mid-America
DRILLING SERVICES, INC.

700 Hicks Drive • Elburn, IL 60119-9059
Phone (630) 365-0600 • Fax (630) 365-1550 • Toll Free (877) 587-9500 • www.madrilling.com

Statement of Qualifications

Mid-America Drilling Services, Inc. is a woman owned business ready to serve your current environmental and geotechnical drilling needs. Our experience is vast and includes:

- Overburden Drilling – 2 ¼", 4 ¼", 6 ¼", 9 ¼", H.S.A.
- Direct Push Geoprobe® and Hand Geoprobe® Services
- Rotary Drilling
- Rock Coring to hundreds of feet (NQ) (HQ)
- Continuous and discrete soil and groundwater sampling
- Monitoring Well, Recovery Well and Piezometer Installation
- Well Abandonment
- Geotechnical Sampling
- ATV/Limited Access Equipment
- Low Clearance Capabilities
- Test Pits/Shallow Excavation & Remediation System Installation

Our experience allows us to provide *superior* drilling services while remaining flexible to your specific needs. By building strong relationships we can tailor our services to meet your particular requirements. We are confident that you will be pleased with our expertise and cost-effective services.

The Mid-America equipment fleet is well maintained and ready to mobilize to your next project. Our fleet consists of both truck mounted drilling and Geoprobe® units. Our equipment includes:

- 3 Diedrich D-120 Drill Rigs, (1-High Torque tandem axle, 1-4x4, 1-4x2)
- Diedrich D-50 Turbo Plus Rubber Track ATV with Geoprobe®
- Diedrich 4X4 D-50 Drill Rig
- 540B Geoprobe® mounted on a Ford SuperDuty Utility Truck
- 540B Geoprobe® mounted on a New Holland Skid Steer
- 540UD Geoprobe® Mounted on a Ford F-250 Pickup Truck
- Hand Geoprobe® Unit – excellent for limited access areas.
- Five International Box Trucks/Support Vehicles
- Ford F700 and F350 Flatbed Support Vehicles
- International Paystar 5000 Flat Water Truck 4x4

Lisa A. Crimaldi is President and Owner of Mid-America Drilling Services, Inc. Her experience includes twenty years in the drilling industry. Her administrative and management experience is vast and encompasses operations management, financial management, marketing and business development, health and safety implementation, personnel management, bonding & insurance. Ms. Crimaldi is currently a board member and co-chairman of the National Drilling Association's Education Committee.

Micheal A. Crimaldi is Mid-America's Vice-President and Field Operations Manager. He has over twenty years of drilling experience including rock coring, rotary drilling, auger drilling, direct push sampling, excavating and various other construction trades. Mr. Crimaldi is primarily responsible for technical supervision and development of innovative methods and tools to increase productivity. He has participated in drilling projects throughout the Mid-Western states including Superfund, RCRA, PECFA, MSD, CTA, EPA, City of Chicago, and various landfill projects.

Gerald Kraemer, P.G. is a Client Services Manager. Mr. Kraemer is responsible for cost estimating and project management. He has a B.A. in Geology/Biology and twenty years of experience in mining, geotechnical and environmental consulting. Mr. Kraemer has managed many projects involving RCRA, Superfund, UST, and state voluntary cleanup jobs throughout the U.S. and a large RI/FS project in Taiwan. Mr. Kraemer is a licensed professional geologist in the state of Illinois.

K. Kyle Arney, P.G. is a Client Services Manager. He is responsible for business development and cost estimating. Mr. Arney has a B.S. in Geology and six years of experience in environmental consulting. He has project and task management experience with RCRA, Superfund, UST, and state voluntary cleanup jobs in the Mid-West. Mr. Arney is a licensed professional geologist in the state of Illinois.

Maureen T. Kayzar is the Office Operations Manager. She has been in the drilling field for eight years. Her past experience includes several years in accounts receivable, accounts payable and general financing. Her responsibilities also include customer service, accounting and managing Mid-America Drilling's office activities.

Health & Safety is extremely important to Mid-America and we expect to continue with our excellent safety record. All Mid-America field staff are experienced, courteous and specially trained to assure each drilling project is a success. All field personnel are 40 hour OSHA Hazwoper certified and hold 8 hour refresher certificates. Our Health & Safety policy includes yearly first aid and CPR training. All of Mid-America's field personnel are medically monitored, respiratory fit tested and bound to a strict alcohol and drug policy.

Our satisfied client list is continually growing as many excellent firms have placed their confidence in us. We look forward to working with you. Please call us toll free at 1-877-587-9800 or visit our website at www.madrilling.com for additional information. Thank you for this opportunity to introduce our firm to you.

Mid-America
DRILLING SERVICES, INC.

700 Hicks Drive • Elburn, IL 60119-9059
Phone (630) 365-0600 • Fax (630) 365-1850 • Toll Free (877) 587-3800 • www.madrilling.com

Chicago Area Client References

Lauren Crafton
Delta Environmental Consultants, Inc.
1717 Park Street, Suite 150
Naperville, Illinois 60563
630-717-4021

Houssam H. El-Moursi, Ph.D., P.E./
Ron Clauson
Professional Service Industries, Inc.
4421 Harrison Street
Hillside, Illinois 60162
708-449-0500

Maureen Wunderlich
Huff & Huff Environmental, Inc.
512 W. Burlington Avenue
LaGrange, Illinois 60525
708-579-5940

Roger Beck
ThermoRetec Corporation
8605 W. Bryn Mawr Avenue, Suite 301
Chicago, Illinois 60631
773-794-9600

Jim Nelson
Graef, Anhalt, Schloemer & Associates
8501 W. Higgins Road, Suite 280
Chicago, Illinois 60631
773-399-0112

Lisa Meager/Paul Micari
Carlson Environmental
312 W. Randolph Street, Suite 1500
Chicago, Illinois 60606
312-346-2140

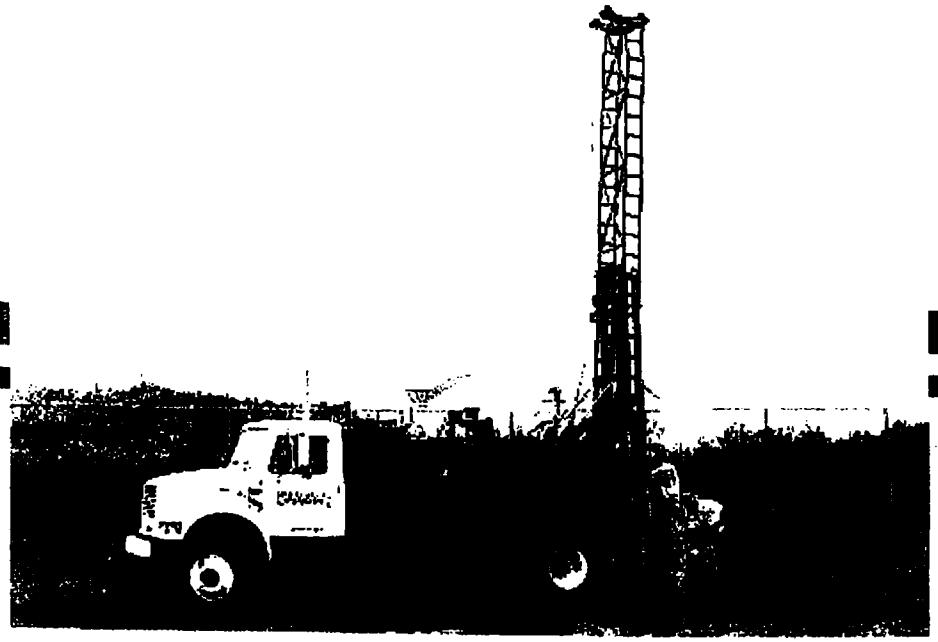
Sheri Johnson
Ecology & Environment, Inc.
33 N. Dearborn Street, Suite 900
Chicago, Illinois 60602
312-578-9243

John Frankenthal
Envirogen, Inc.
1150 N. 5th Ave., Suite C
St. Charles, Illinois 60174
630-762-1400

John Robbins
Handex of Illinois
1701 W. Quincy Avenue, Suite, 31
Naperville, Illinois 60540
630-527-1666

Brett Whittleton, P.E./P.G.
ARCADIS Geraghty & Miller
35 E. Wacker Drive, Suite 1000
Chicago, Illinois 60601
312-263-6703

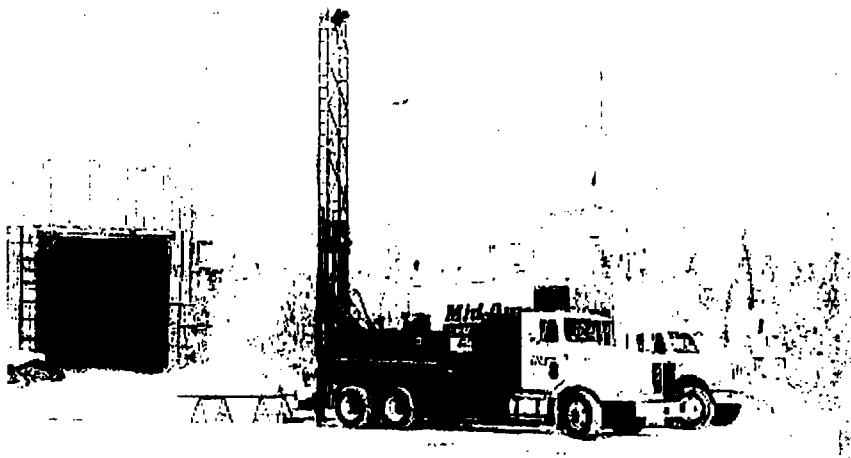
Quality service is our goal!



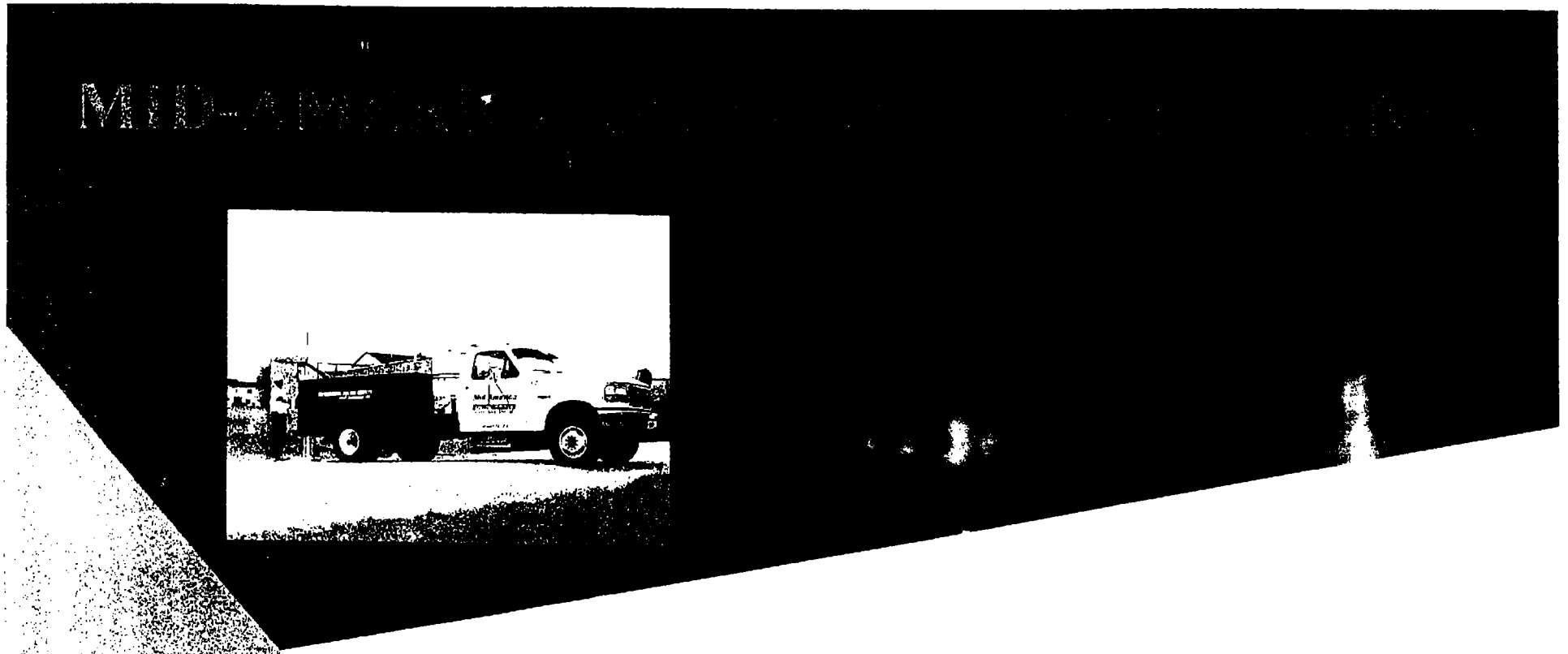
MID-AMERICA

Drilling Services, Inc.

MID-AMERICA
DRILLING SERVICES, INC.

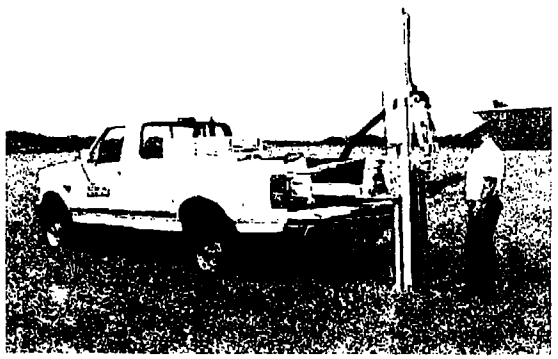


Rock Coring Expertise for the Mining, Construction & Environmental Industries



GEOPROBE

A cost effective alternative to standard auger drilling



ACORD CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YY) 04/24/2000

PRODUCER (630)572-1550 FAX (630)574-3278
J. J. Adams & Associates, Inc
2021 Spring Road
Oak Brook, IL 60523-1852

Attn: Ext:

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED
Mid-America Drilling Services, Inc.
700 Hicks Drive
Elburn, IL 60119

COMPANIES AFFORDING COVERAGE

COMPANY A: CNA Insurance Company
COMPANY B: American International Specialty (AIG)
COMPANY C:
COMPANY D:

COVERAGES

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS MADE X OCCUR OWNER'S & CONTRACTOR'S PROT X Per Project Aggreg	1075561788	04/21/2000	04/21/2001	GENERAL AGGREGATE PRODUCTS - COMP/OP AGG PERSONAL & ADV INJURY EACH OCCURRENCE FIRE DAMAGE (Any one fire) MED EXP (Any one person)	$ 2,000,000 $ 1,000,000 $ 1,000,000 $ 1,000,0 $ 100,000 $ 5,000
A	AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS	1075561791	04/21/2000	04/21/2001	COMBINED SINGLE LIMIT BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE	$ 1,000,000 $ $ $
	GARAGE LIABILITY ANY AUTO				AUTO ONLY - EA ACCIDENT OTHER THAN AUTO ONLY: EACH ACCIDENT AGGREGATE	$ $ $
A	EXCESS LIABILITY X UMBRELLA FORM OTHER THAN UMBRELLA FORM	1075561810	04/21/2000	04/21/2001	EACH OCCURRENCE AGGREGATE	$ 4,000,000 $ 4,000,000 $
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY THE PROPRIETOR/ PARTNERS/EXECUTIVE OFFICERS ARE: INCL / EXCL	1075561807	04/21/2000	04/21/2001	X WC STATUTORY LIMITS / OTHER EL EACH ACCIDENT EL DISEASE - POLICY LIMIT EL DISEASE - EA EMPLOYEE	 $ 500,000 $ 500,000 $ 500,000
B	OTHER Pollution Liability	CPO2678348	05/15/1999	05/15/2002	$2,000,000 occurrence $2,000,000 aggregate	

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

CERTIFICATE HOLDER

Sample Certificate
** For Informational Purposes Only **

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL _____ DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE
Brian Geary/AAC

QUALIFICATION STATEMENT

Roy F. Weston, Inc.
3 First National Plaza, Suite 1990
70 West Madison Street
Chicago, Illinois 60602-4206

Secondary Work Area (From attached list)	

Project Title: Predesign/Remedial Design Services for Moss-American Superfund Site [redacted]

Client: [redacted]

Objective: Develop and implement the predesign and remedial design (RD) work plans for this site in accordance with the Statement of Work (SOW) of the Consent Decree.

Background: The Moss-American site in Milwaukee, Wisconsin, is the former location of a 23-acre creosoting facility where railroad ties and other wood products were treated and stored. The facility was first established in 1921. As a result of the facility operations, chemicals used in the wood treating process were discharged to site soils, groundwater, and surface water. Studies conducted by the U.S. Environmental Protection Agency (EPA) identified site soils, river sediments, and groundwater contaminated with polycyclic aromatic hydrocarbons (PAHs), which are common constituents of creosote. EPA prepared a Record of Decision (ROD) that identified the measures to be taken to mitigate the site contamination. Remedial action (RA) costs for this site were preliminarily estimated to be between $25,000,000 and $30,000,000 under EPA's original proposed remedy.

Work Scope: The original proposed remedy consists of the following remedial components:

- Realignment and relocation of a 5-mile stretch of the Little Menomonee River.
- Removal, treatment (by soil washing and bioremediation), and disposal of contaminated soil, sediment, and debris present at the former facility, river, floodplain, former landfill, and other areas adjacent to the site.
- Extraction and treatment of contaminated groundwater.
- Long-term monitoring, operation, and maintenance of remedial systems.

WESTON has completed or is presently conducting predesign and RD tasks associated with the project, including:

- Developing site- and compound-specific laboratory and field analytical procedures.
- Conducting detailed extent-of-contamination studies.
- Evaluating alternative river alignments, including river, floodplain, and watershed hydraulics studies and wetlands assessments.

- Conducting bench-scale and pilot-scale treatability studies on soil washing and bioslurry treatment technologies for soil and groundwater matrices.

WESTON's predesign work has led to several key technical demonstrations that support a forthcoming cost-saving ROD amendment and a revised site remedy. WESTON's treatability study demonstrated the infeasibility of using bioslurry and soil washing technologies to treat complex PAH constituents. WESTON's ecological assessment of the habitat loss that would result from a proposed realignment of the Little Menomonee River prompted EPA to consider alternate sediment management approaches. WESTON conducted a revised risk assessment that considered current and future land use, new relative potency factors, and updated EPA risk assessment protocols. This assessment, combined with our more accurate extent of contamination studies, has reduced the volume of soil and sediment that will require remedial management.

WESTON recently prepared a focused remedial alternatives analysis and innovative, low-cost groundwater containment and in situ treatment plans. These plans will become part of the administrative record supporting a ROD amendment. It is currently estimated that RA costs for the site will be reduced by several million dollars as a result of WESTON's strategic project management.

In addition, WESTON has implemented an interim RA to address dense nonaqueous phase liquid (DNAPL) free product in site soils and groundwater. The system design and construction are complete, and the system is currently being operated and maintained by WESTON. The DNAPL recovery and product recycling system uses a series of subgrade wells, product-only extraction pumps, oil/water separation, storage tanks, and off-site recycling and reuse. (0896)

Project Title: Environmental Risk Assessment ([redacted]

Client: [redacted]

Objective: Evaluate the environmental risks associated with neutralizing one corporation's Gramercy, Louisiana, facility's red mud stream with the neighboring facility's hydrochloric acid (HCl) stream and placing the streams in a red mud bed.

Background: Until 1988, the Gramercy complex contained a chloroalkali facility, processed bauxite, and manufactured fluorocarbon. Part of the facility's operation included the neutralization of a red mud stream using acid from the chloroalkali facility. In 1988, the chloroalkali and fluorocarbon facilities were sold to the neighboring facility. The acid and red mud streams continued to be combined, with the effluent discharged o Red Mud Bed 3. Before neutralizing and placing the acid and mud streams in a fourth red mud bed, the companies wanted to evaluate their potential environmental risks.

Work Scope: WESTON visited the facilities, interviewed personnel, and reviewed available information to establish a list of regulatory issues for three major areas:

- The HCl stream from the fluorocarbon facility.
- The red mud stream produced during alumina recovery.
- The red mud bed where these two streams would be pumped for settling.

Resource Conservation and Recovery Act (RCRA) permitting status was an issue for each area. For the HCl stream, an additional issue was whether varying the stream's composition would cause Toxicity Characteristic Leachate Procedure (TCLP) limits to be exceeded or result in a combined stream considered a RCRA hazardous waste. Red mud stream issues also included the applicability of the Bevill amendment, which excludes red mud from RCRA, and whether effluent discharge from the red mud beds could necessitate that the neighboring facility meet RCRA requirements or put it in violation of its National Pollutant Discharge Elimination System (NPDES) permit. Other issues for the red mud bed included potential groundwater problems and the possibility that the bed was not properly permitted to receive the mixed stream.

In addition to delineating the issues for these specific areas, WESTON established a list of general issues. These issues included applicability to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980; the Superfund Amendments and Reauthorization Act (SARA) of 1986; Louisiana Department of Environmental Quality solid waste regulations; air permitting requirements; use of a brine mud stream at the complex; and pollution prevention.

WESTON concluded that the red mud bed was not regulated under RCRA, the Bevill amendment appeared applicable, and the environmental risks were low for operating the red mud bed using the acid stream as a neutralizer. (0295)

Project Title: Remedial Investigation/Feasibility Study for International Creosoting State Superfund Site.
Client: Confidential Client

Objective: Conduct an RI/FS to determine the magnitude and extent of environmental impacts; evaluate the potential for unacceptable risks through baseline human health and ecological risk assessments; and identify appropriate and cost-effective remedial options to address any unacceptable risks.

Background: The International Creosoting State Superfund Site (site) is located in an industrial area of Beaumont, Jefferson County, Texas. The site was used for wood treating activities from around 1900 until the early 1970s at which time the plant was dismantled. Subsequent uses of the site have included asphalt manufacturing. Significant site investigation activities were performed at the site since the early 1990s and the presence of creosote along with other chemicals (polycyclic aromatic hydrocarbons [PAHs], dioxin/furans, and metals) were identified in the on-site soils and groundwater and in the sediments in the adjacent bayou.

Based on the results of the site investigation activities, a decision was made to separate the site into two units: the Land-Based Operable Unit (LBOU) and the Brakes Bayou Operable Unit (BBOU). The LBOU includes the soils (surface and subsurface) as well as groundwater and free-phase creosote that are present within the main site area or land-based portion of the property. The BBOU includes the portion of the adjacent bayou that has been impacted by site-related constituents. Based on available information, the boundary of the BBOU extends from a point approximately 300 to 800 feet upgradient of the site downward to the confluence of the bayou and Neches River. Additional sampling in the bayou north of the site is planned to refine the upgradient extent of the BBOU.

Work Scope: A human health risk assessment and ecological screening assessment for the LBOU were completed and submitted to the Texas Natural Resource Conservation Commission (TNRCC) in March 1998. The assessments indicated that minimal risk to human health and ecological receptors is present at the site; however, the proposed site remedy (capping portions of the site) will address this risk.

A baseline risk assessment (BRA), including an ecological risk assessment (ERA) for the BBOU was completed and submitted to the TNRCC in January 1999. The primary purpose of the assessment was to evaluate the potential human health and ecological effects associated with the bayou in the absence of any remedial action. In addition to evaluating the potential effects, the assessment was used to evaluate acceptable chemical concentrations that could remain in the bayou without causing unacceptable excess risk. The results of this risk assessment were used to establish appropriate remediation criteria for the BBOU. These criteria will be used during the BBOU feasibility study as the performance goals for remedial activities.

An ERA checklist was completed for the BBOU with results of this checklist indicating the need for further assessment of the chemicals present in the bayou sediment and surface water. Following TNRCCs tiered approach for conducting ERAs, a Tier 2 Screening Level Ecological Risk Assessment (SLERA) was conducted, using conservative exposure assumptions and toxicity data available in the literature. Established ecological screening benchmarks were used to screen COPCs for evaluation in the SLERA. Using birds, mammals, fish, plants, aquatic invertebrates, and benthic macroinvertebrates as potential receptors for the BBOU, the hazard quotient approach was used as the basis for evaluating ecological risk. The SLERA indicated that there is potential for adverse effects to avian, mammalian, and benthic receptors. For those COPCs that potentially posed an unacceptable risk (hazard quotient/hazard index in excess of 1.0), preliminary medium-specific protective concentration levels (PCLs) were calculated.

Based on the results of the results of the baseline human health risk assessment and SLERA, it appears that clean up to human health based levels will be protective of ecological receptors. [redacted]

Project Title: Baseline Human Health Risk Assessment for the Murray Smelter Superfund Site
Murray, Utah (04603-051-021)

Client: Environmental Protection Agency (EPA)
Region VIII

WESTON prepared a Baseline Human Health Risk Assessment for the Murray Smelter Superfund Site, located in Murray, Utah. This document was prepared for EPA, in close cooperation and consultation with the State of Utah, along with numerous constructive recommendations and input from the PRPs (Exhibit B).

Site Description

The Murray Smelter operated from 1872 to 1949, processing mainly lead and silver ores. The chief solid waste products generated by the smelter were arsenic, cadmium, and slag. Large masses of slag still remain on-facility, both exposed at the surface and covered by fill and buildings. The main reason for concern at the site is that metals present in the slag and other on-facility smelter wastes might be posing a risk to humans or the environment. The baseline risk assessment encompassed the site itself and adjacent off-facility areas that might be impacted by historic or ongoing releases from the site.

Chemicals of Potential Concern

Screening level calculations for this site indicated that lead and arsenic were the only chemicals likely to pose substantial health concerns to humans. A detailed sampling plan for arsenic and lead in site media (soil, indoor dust, groundwater, slag) was developed to support the human health risk assessment. This included a plan for locating buried sources of arsenic which were impacting groundwater.

Exposure Scenarios

Populations evaluated in the assessment included on-site and off-site residents, area teenagers who trespass on the slag piles, and on-site workers. Site-specific information indicated that the worker population included both individuals who worked mainly indoors with only limited opportunity for contact with soil, and workers who spent most of the time outdoors in direct contact with soil. Therefore, the worker scenario included both "non-contact intensive" and "contact intensive" workers. Exposure pathways evaluated quantitatively included:

- Ingestion of soil/dust (current and future residents and workers)
- Ingestion at slag piles (current and future teenagers)
- Ingestion of groundwater (future residents and workers)

Other pathways (inhalation of soil particles in air, dermal contact with soil or water) were evaluated semi-quantitatively in a screening-level approach which demonstrated that these pathways were not significant.

Results

Non-cancer and cancer risks from exposure to arsenic in soil and slag were calculated for residents, teenagers, and workers following standard EPA guidance. Site-specific data incorporated into the calculations included estimated RBA values for arsenic in soil and slag, and site-specific estimates of arsenic levels in indoor dust as a function of levels in outdoor soil. The RBA values were derived from absorption studies in swine, and these data supported the view that arsenic absorption from soil and slag was much lower (20-30%) than the typical default assumption (80-100%). Likewise, data on indoor dust levels of arsenic supported the view that indoor levels were only 20-30% of the usual default assumption. Incorporation of these two items of site data lead to a marked decrease in the estimated risks from arsenic and a corresponding increase in the preliminary action level for arsenic in soil. For residents, exposure and risk levels were below EPA's usual guidelines (HQ < 1E+00, cancer risk < 1E-04) in all areas except one (where there are no current residents). These predictions were supported by urinary arsenic data collected from local residents, which showed urinary arsenic levels were well within (or even below) national averages. For workers, risks from arsenic were mainly below the usual level of concern for non-contact intensive workers, but were generally above the level of concern for contact-intensive workers. Risks to residents and workers from ingestion of arsenic in water were of clear concern at numerous on-site wells.

Risks from lead were evaluated using pharmacokinetic models. In areas where land use is or might be residential, the lead risk assessment focused on young children, since young children tend to have higher lead exposures than older children or adults, because young children tend to absorb more lead than do adults, and because young children are more susceptible to the adverse effects of lead on the nervous system. EPA's IEUBK model was used to predict blood lead levels in on-facility and off-facility residential children, using site-specific estimates of lead RBA in soil, and site-specific estimates of the contribution of soil lead to dust lead. These site-specific adjustments decreased the predicted incidence of elevated blood lead levels, but predicted values remained above a level of concern in most areas. Comparison of the predicted blood lead values with a limited set of values measured in on-site residents suggested that the IEUBK model might be over-predicting risks somewhat, but the number of blood lead measurements was too small to draw a firm conclusion.

In areas where land use is commercial/industrial, the population of chief concern for lead exposure is workers rather than children, with special attention to pregnant women and women of child-bearing age. Lead risks to workers was evaluated using the simplified pharmacokinetic model described by Bowers et al. These calculations also included site-specific adjustments for lead RBA in soil and for soil/dust ratios. Lead risks were found to be below a level of concern for non-contact intensive workers in most on-site locations, but above a level of concern for contact-intensive workers at all locations. Lead in groundwater was found not to be of significant health concern for most wells, although a few on-site wells (especially those completed directly in the slag) had levels sufficiently high that they could be of concern to workers.

Project Title: Baseline Human Health Risk Assessment Clark Fork River Superfund Site
Deer Lodge, Montana (04500-088-100)

Client: Environmental Protection Agency (EPA)
Region VIII

WESTON prepared a Baseline Human Health Risk Assessment for the Clark Fork River Operable Unit of the Milltown Reservoir Superfund Site, which is located in the Deer Lodge valley of central Montana. The document was prepared for EPA Region VIII, in close cooperation with the State of Montana, along with input and suggestions from the PRP.

Site Description

The Clark Fork River-Operable Unit is defined as the area within the 100-year flood plain of the Clark Fork River between the headwaters of the river (near Anaconda, Montana) and the Milltown Reservoir (just south of Missoula, Montana). This portion of the Clark Fork River spans a linear distance of approximately 90 miles and comprises about 120 miles of river shoreline. For convenience, the river within the Operable Unit was divided into three main reaches (A, B, and C), with Reach A being further divided into two sub-reaches (A-1 and A-2).

The area contained within the Clark Fork River Operable Unit is of potential concern to both human and ecological receptors because of extensive tailings deposits in and along the river. These tailings are the result of historic releases from numerous mining and milling sites which operated within the area of Clark Fork drainage. It is estimated that nearly 400 billion tons of tailings were released into the Clark Fork drainage between 1880 and 1982.

Chemicals of Potential Concern

Tailings contain a variety of different metals, and excessive levels of some of these metals could be harmful to human health and the environment. Chemicals of potential concern at this site were selected by comparing the maximum detected concentration value in soil/tailings or in river water/groundwater to screening level risk-based concentration values developed by EPA. Based on this approach, the chemicals of potential concern selected for quantitative evaluation at this site are as follows:

1. Antimony
2. Arsenic
3. Beryllium
4. Cadmium
5. Copper
6. Iron
7. Lead
8. Manganese
9. Mercury
10. Zinc

It should be noted that this selection approach was intended to be conservative. That is, it is considered likely that some of the chemicals retained for evaluation by this screening approach may pose little or no risk, but that there will be no chemicals of authentic concern which escape this screen.

Exposure Assessment

Because of the large size of the Clark Fork River Operable Unit and the variety of land uses which occur within the unit, there are a number of different populations who may come into contact with tailings-related contamination, and each of these populations may be exposed by several different exposure pathways. Each of these potential exposure scenarios was reviewed in order to identify which were most likely to be of concern to humans and which were likely to contribute the majority of risk to each of the populations being assessed. Those pathways which were judged to be sufficiently important to warrant quantitative evaluation are listed below:

Population	Medium and Exposure Route
Resident	Soil/Dust (incidental ingestion in and about the home and yard) Home-grown vegetables or native vegetation (ingestion) Water (ingestion as drinking water)
Rancher/Farmer	Soil (incidental ingestion while working in the field) Locally-raised livestock (ingestion)
Hunter/Fisherman	Fish/Game (ingestion) River water (dermal contact while fishing)
Swimmer/Rafter/ Tuber	River water (ingestion and dermal contact while in the water) Tailings/soil (ingestion while climbing in or out of the river) Pooled water (dermal contact)

Based on screening level calculations, other exposure pathways were judged to be sufficiently minor that detailed quantitative evaluation was not warranted.

The level of human exposure to chemicals of potential concern from each of these pathways was evaluated using the standard equations and methods recommended by EPA for use at Superfund sites. Values for key exposure parameters were derived from EPA guidance documents or local area-specific studies whenever possible. In some cases, there are few or no data to support the

selection of values, so professional judgment was required for some parameters. Exposure parameters were obtained for people with average levels of exposure, as well as for individuals who have "Reasonable Maximum Exposure" (RME).

Risk Characterization

The most common approach for characterizing the risks at a site is to identify a number of discrete locations ("exposure points"), and to calculate the risks to people who are exposed at those locations. Each exposure point is an area where a member of the population of concern is expected to be randomly exposed. Because the Clark Fork River Operable Unit is so large (covering several hundred square miles), and because systematic investigations of the nature and extent of contamination have been performed at only a few locations within the OU, this approach could not be applied at all locations of plausible concern. An alternative approach to evaluating risks at a site is to calculate the concentration of a chemical in a medium that corresponds to some specified level of health risk, and then to review site data to determine if, where, and by how much site concentrations exceed the calculated concentration value. Such a risk-based concentration value is often referred to as an "RBC." At this site, the standard approach was used whenever sufficient data were available to support calculation of meaningful exposure point concentrations. RBC values were also calculated for each medium to help allow rapid screening and evaluation as additional monitoring data become available.

Results

The main findings of the human health risk assessment for the Clark Fork River Operable Unit are as follows:

1. The principal mining-related chemical of potential human health concern in environmental media is arsenic. Other mining-related chemicals appear to pose no substantial human health hazard.

2. Arsenic levels in tailings and contaminated soil do not result in cancer or noncancer health risks to humans that exceed the normally acceptable risk range (HQ > 1, cancer risk > 1E-04), except for residents who live immediately adjacent to the river in Reach A (the location of maximum tailings deposition). Available data indicate that there are very few such residents at present, and future residential development immediately adjacent to the river is considered to be relatively unlikely because of the risks from flooding.

3. Arsenic levels in shallow groundwater (less than 25 feet in depth) may exceed typically acceptable risk levels and/or state requirements in some locations, especially near the river in Reach A. Arsenic levels in deeper wells (more than 25 feet deep), are mainly below typically acceptable risk levels and/or state requirements. Current zoning laws require drinking water wells to be at least 25 feet deep.

4. Arsenic levels in locally raised beef, fish from the Clark Fork River, and waterfowl from near the Operable Unit, appear to be within the normally acceptable risk range.

No data are available on arsenic levels in local produce.

5. Arsenic levels in the water of the Clark Fork River do not pose risks outside the normally acceptable risk range to people who wade or swim in the river.

Based on these findings, it is concluded that risks to humans from chemical contaminants in tailings present along the Clark Fork River are mainly or entirely within the normally acceptable range, except for current or future residents who reside in locations immediately adjacent to the river in areas of substantial tailings deposits.

Project Title: Supplemental Human Health Risk Assessment Lincoln Park *Superfund Site*
Canon City, Colorado (11525-001-001)

Client: **Environmental Protection Agency (EPA)**
Region VIII

WESTON prepared a Supplemental Human Health Risk Assessment for the Lincoln Park Superfund Site, located in Canon City, Colorado. This project was performed under the direction of the Colorado Department of Public Health and Environment (CDPHE).

Team Approach

A working group of project managers and health scientists from CDPHE, EPA, the Cotter Corporation, and WESTON were assembled to discuss all of the technical issues relating to methods, data selection, statistical approaches, etc. WESTON led the discussions at these sessions, and mediated the development of consensus on controversial issues as they arose between members of the technical workgroup. This planning phase remained an interactive process throughout the development and finalization of the project.

Site Description and Basis for Concern

The Lincoln Park Superfund Site includes the area surrounding a uranium mill operated by the Cotter Corporation on a 640-acre site in south-central Colorado, about 2.5 miles south of Canon City and about 1.5 miles south of the residential community of Lincoln Park. The uranium extraction process generated two main types of wastes: tailings (the fine-grained particles of ore remaining after the uranium has been extracted), and raffinate (the waste liquid recovered from the uranium extraction solutions). These wastes were both disposed of to a series of unlined ponds on the site. Wastes from these impoundments contaminated the environment by several pathways, including a) airborne dispersion of dried tailings, b) infiltration of leachate to groundwater, and c) erosion of sediments and dissolved constituents along the main surface water drainage (Sand Creek).

Chemicals of Potential Concern

Chemicals of potential concern were selected in a very conservative approach, retaining essentially all chemicals detected in any medium that could not be excluded by one of two tests: 1) the chemical is a beneficial mineral (e.g., iron, sodium, calcium) and environmental levels do not lead to intakes that exceed recommended daily intakes, and 2) the chemical exists at a concentration that is far below a possible level of health concern. Chemicals of concern selected in this process included not only all of the radionuclides of the uranium-238 series, but also a number of other non-radioactive metals present in ores and tailings at the site, including arsenic, beryllium, cadmium, cobalt, molybdenum, lead, manganese, nickel, selenium, and vanadium.

Exposure Scenarios

Exposure of current and future residents were assessed for both the current residential community

(Lincoln Park) and for hypothetical future residential communities built in closer proximity to the mill property. Exposure pathways which were evaluated included exposure to soil (direct ingestion, external radiation), inhalation of air (both dust particles derived from contaminated soil or tailings, along with gaseous releases of radon-222), ingestion of drinking water from contaminated wells, and ingestion of fruits and vegetables from gardens containing contaminated soil and/or irrigated with contaminated groundwater.

Special Issues and Approaches

Several special issues arose during the performance of this project. First and most important was the issue of background levels of chemicals in soil and the relative increase over background contributed by the mill. This problem was especially difficult to evaluate because of large variations in background levels from location to location due to variations in the geology and origin of the soil. Ultimately, the approach found to be most successful was plotting soil concentrations on a color-coded map and examining the spatial patterns. This effort supported the view that areas downwind of the mill had been impacted by airborne releases, but that the community of Lincoln Park (located in the cross-wind direction) had not.

Next was the issue of food chain exposures. Many residents have their own gardens and/or raise livestock for personal consumption, and there was a high level of anxiety regarding exposures via these pathways. In order to evaluate this pathway, a special effort was undertaken to collect samples of local produce from as many homes as possible. Emphasis was placed on homes which used contaminated groundwater for irrigation, since it was believed that samples from such locations were more likely to be impacted than from areas not irrigated with contaminated water. At the end of the project more than 60 samples had been analyzed for both radiological and non-radiological contaminants, and the data provided a firm basis for assessment of this pathway.

Third, a number of remedial activities have taken place at the mill in recent years, including transfer of the tailings from unlined to lined ponds (to stop infiltration to groundwater) and a program to keep all of the tailings wet so that wind erosion no longer occurs. Because of these actions, environmental concentrations in water and air have been changing (decreasing) over time. Therefore, the risk calculations were performed in two phases: a) a baseline evaluation (before the impact of these on-site remedial activities), and b) an assessment of risks at the present time (in order to determine what further actions are needed).

Results

Risk calculations performed in this project indicated the following main conclusions:

Risks from Ground Water

Ground water wells located along the Sand Creek channel are impacted mainly by uranium and molybdenum. Historically, risk levels associated with drinking this water were very high. Although concentration values have been decreasing in recent years, some wells remain at concentrations above the risk levels usually considered acceptable. The risks are highest near the mill, and tend to decrease at locations further downstream. Many wells exist that appear to be minimally impacted and have risks within normal background levels. Some wells have elevated

levels of sulfate, but most of these are probably not related to releases from the mill.

Risks from Air

Direct inhalation exposures from air have never been of non-cancer concern, even when active erosion of dust was occurring. Cancer risks from air are dominated by radon, but the risks from radon appear to be similar to those that occur naturally across the United States. Excess cancer risk contributed by inhalation of wind-blown releases from the site are negligible.

Risks from Soil

Non-cancer risks to current or future residents from exposure to soil are not of concern in any location. Cancer risks from soil are highest in areas just east and just west of the site, consistent with previous studies which indicated that wind-blown releases of tailings have impacted these locations. This risk is due almost entirely to external radiation from radium. Available data do not suggest that there has been any observable transport of tailings north of the site into the Lincoln Park area, so estimated cancer risks to current Lincoln Park residents from radium in soil are believed to be natural in origin.

Risks from Local Produce

Non-cancer and cancer risks to residents from eating vegetables and fruits grown in the Lincoln park area are below a level of concern, even if the crops were irrigated with contaminated well water.